

REMARKS

As initial matter, Applicant thanks the Examiner for the courtesies extended during the interview in person by the undersigned with the Examiner on February 25, 2004.

This reissue application is a continuation of reissue application number 09/590,633, filed June 8, 2000, now U.S. Patent No. Re37614, issued April 2, 2002. This application and reissue application number 09/590,633 each sought reissue of U.S. Patent No. 5,764,724, issued June 9, 1998 (hereinafter "the Ohlson patent").

Claims 20-24 were pending in this application. Claims 1-19 were previously canceled, without prejudice or disclaimer. By this Amendment, new claims 25-28 have been added, and claims 20, 21, 23 and 24 have been amended to place the claims in better form for examination and to clarify the claimed invention. Accordingly, claims 20-25 are now pending, with claims 20-24 being in independent form.

Claims 20-24 were objected to as purportedly being based upon a defective reissue oath/declaration under 35 U.S.C. §251.

Attached as Exhibit 1 hereto is a Supplemental Reissue Application Declaration By The Inventor, in compliance with 37 C.F.R. §1.175.

Accordingly, withdrawal of the rejection is respectfully requested.

In the July 3, 2003 final Office Action, claims 20, 21, 23 and 24 were rejected under 35 U.S.C. §112, first paragraph, as purportedly failing to comply with the enablement requirement.

Applicant filed on October 3, 2003 an Amendment including amendments to claims 20, 21, 23 and 24, and addition of new claim 25. The November 26, 2003 Advisory Action stated that the October 3, 2003

Amendment was not entered because the proposed new claim 25 introduced new issues which required additional consideration and/or search. The Advisory Action also stated, however, that the amendments to claims 20, 21, 23 and 24 overcome the rejection of claims 20, 21, 23 and 24 under 35 U.S.C. §112, first paragraph, in the July 3, 2003 final Office Action.

In view of the remarks in the November 26, 2003 Advisory Action, the unentered amendments to claims 20, 21, 23 and 24 are repeated by this Amendment.

Accordingly, withdrawal of the rejection of claims 20, 21, 23 and 24 under 35 U.S.C. §112, first paragraph, is requested.

The drawing changes filed on February 28, 2003 were objected as purportedly introducing new matter.

In view of the claim changes requested hereby, no drawing amendment is necessary, so the issue of the drawing correction earlier proposed is now moot.

The specification was objected to as purportedly not providing support for the claim amendments, specifically the feature of "under-table tube capable of imaging in a style of below-table tube".

In view of the claim changes requested hereby, the issue of whether the specification can support the "under-the-table tube" feature is now moot.

As discussed during the interview on February 25, 2004, this application was filed to provoke an interference with U.S. Patent No. 6,155,713 to Watanabe ("the Watanabe patent").

As demonstrated in the Communication (including Exhibits A-I) filed on April 5, 2001 with this reissue application, all of the limitations of claim 1 of the Watanabe patent are disclosed or

suggested by the Ohlson patent. A copy of the April 5, 2001 Communication is attached as Exhibit 2 hereto.

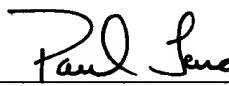
Accordingly, Applicant requests that an interference be declared as between this application and the Watanabe patent.

If a petition for an extension of time is required to make this response timely, this paper should be considered to be such a petition, and the Commissioner is authorized to charge the requisite fees to our Deposit Account No. 03-3125.

The Office is hereby authorized to charge any additional fees that may be required in connection with this response and to credit any overpayment to our Deposit Account No. 03-3125.

If a telephone interview could advance the prosecution of this application, the Examiner is respectfully requested to call the undersigned attorney.

Respectfully submitted,



Paul Teng, Reg. No. 40,837
Attorney for Applicant
Cooper & Dunham LLP
Tel.: (212) 278-0400

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

**SUPPLEMENTAL
REISSUE APPLICATION DECLARATION BY THE INVENTOR**

Docket Number (Optional)

1166/61926-A

I hereby declare that:

Each inventor's residence, mailing address and citizenship are stated below next to their name.

I believe the inventors named below to be the original and first inventor(s) of the subject matter which is described and claimed in patent number 5,764,724, granted June 9, 1998 and for which areissue patent is sought on the invention entitled METHOD OF MAKING X-RAY PHOTOGRAPHS OR EXPOSURES OR OTHER TYPE OF RADIATION SENSING, SUCH AS ELECTRONIC IMAGE STORAGE, AND Athe specification of which PATIENT TABLE HAVING A RECEPTOR UNIT FOR SUCH PHOTOGRAPHY, EXPOSURE OR IMAGE STORAGE☐ is attached hereto.☒ was filed on April 5, 2001 as reissue application number 09/827,380,
which is a continuation of reissue appl. no. 09/590,633, filed on June 8, 2000,
and was amended on February 28, 2003
(If applicable)

I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.

I verily believe the original patent to be wholly or partly inoperative or invalid, for the reasons described below. (Check all boxes that apply.)

☐ by reason of a defective specification or drawing.☒ by reason of the patentee claiming more or less than he had the right to claim in the patent.☐ by reason of other errors.

At least one error upon which reissue is based is described below. If the reissue is a broadening reissue, such must be stated with an explanation as to the nature of the broadening:

The inadvertent failure to include at least one broader apparatus claim such as claim 20 and/or at least one broader system claim such as claim 22, that does not include the limitations of "arms" and a "link" as recited in claim 8 of the original patent.

[Page 1 of 2]

This collection of information is required by 37 CFR 1.175. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

(REISSUE APPLICATION DECLARATION BY THE INVENTOR, page 2)

Docket Number (Optional)

1166/61926-A

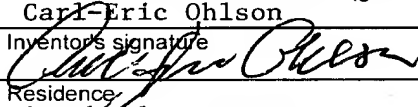
All errors corrected in this reissue application arose without any deceptive intention on the part of the applicant.

Note: To appoint a power of attorney, use form PTO/SB/81.

Correspondence Address: Direct all communications about the application to:

☒ Customer Number: 23432

OR

<input checked="" type="checkbox"/> Firm or Individual Name	Ivan S. KAVRUKOV, COOPER & DUNHAM LLP				
Address	1185 Avenue of the Americas				
Address					
City	New York	State	NY	Zip	10036
Country	U.S.A.				
Telephone	(212) 278-0400	Fax	(212) 391-0525		
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine and imprisonment, or both, under 18 U.S.C. 1001, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this declaration is directed.					
Full name of sole or first inventor (given name, family name) Carl-Eric Ohlson					
Inventor's signature 		Date 2004-06-04			
Residence Stockholm SWEDEN		Citizenship SWEDISH			
Mailing Address Grevgatan 67, S-114 59, Stockholm SWEDEN					
Full name of second joint inventor (given name, family name)					
Inventor's signature		Date			
Residence		Citizenship			
Mailing Address					
Full name of third joint inventor (given name, family name)					
Inventor's signature		Date			
Residence		Citizenship			
Mailing Address					
<input type="checkbox"/> Additional joint inventors or legal representative(s) are named on separately numbered sheets forms PTO/SB/02A or 02LR attached hereto.					

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Reissue Application Of: Carl-Eric Ohlson

For: METHOD OF MAKING X-RAY PHOTOGRAPHS OR
EXPOSURES OR OTHER TYPE OF RADIATION
SENSING, SUCH AS ELECTRONIC IMAGE
STORAGE, AND A PATIENT TABLE HAVING A
RECEPTOR UNIT FOR SUCH PHOTOGRAPHY,
EXPOSURE OR IMAGE STORAGE

Reissue Application No.: [Continuation of Reissue Application S.N. 09/590,633]

Reissue Application Filing Date: Concurrently herewith

Original Patent No.: 5,764,724

Original Patent Granted On: June 9, 1998

1185 Avenue of the Americas
New York, New York 10036

Assistant Commissioner for Patents
Washington, D.C. 20231
Sir:

COMMUNICATION

This reissue application seeks an interference proceeding with Watanabe U.S. Patent No. 6,155,713 granted on December 5, 2000, and is filed within a year of December 5, 2000, the grant date of the Watanabe patent. A copy of the Watanabe patent is attached hereto as **EXHIBIT G.**

While this application's actual filing date is more than two years after June 9, 1998, the grant date of the original, Ohlson U.S. Patent No. 5,764,724, it is entitled to broadened claims as a continuation of parent reissue application Ser. No. 09/590,633 filed on June 8, 2000, within

two years of the original patent, with broadened claims that timely demonstrated applicant's intent to broaden.¹

Claim 20 herein is a verbatim copy of claim 1 of the Watanabe patent. Support in Ohlson U.S. Patent No. 5,764,724 is demonstrated in two ways in the attachment to this paper:

1. The claim chart attached hereto as **EXHIBIT A** demonstrates an example of support based on Examiner's comments made when rejecting, over Ohlson, Watanabe application claim 1 that became patent claim 1 after being combined with application claim 2. The Final Office Action that made this rejection is attached hereto as **EXHIBIT B**; and
2. The claim chart attached hereto as **EXHIBIT C** demonstrates an example of independent support in Ohlson.

¹ See MPEP § 1451 (Rel.84A-7/00 Pub. 605):

CONTINUATION REISSUE APPLICATIONS

* * *

The decision of *In re Graf*, 111 F.3d 874, 42 USPQ2d 1471 (Fed. Cir. 1997) interprets 35 U.S.C. 251 to permit multiple reissue patents to issue even when the multiple reissue patents are not for "distinct or separate parts of the thing patented."

* * *

Accordingly, prosecution of a continuation of a reissue application will be permitted (despite the presence of the parent reissue) where the continuation complies with the rules for reissue.

See, also, MPEP § 1412.03 (Rel.84A-7/00 Pub. 605):

WHEN A BROADENED CLAIM CAN BE PRESENTED

A broadened reissue claim can be presented within two years from the grant of the original patent in a reissue application. ... Finally, if intent to broaden is indicated in a parent reissue application within the two years, a broadened claim can be presented in a continuing reissue application after two years.

See, also, copy of Rule 1.177 effective November 7, 2000 and comments thereon published in Federal Register, Vol. 65, No. 175, September 8, 2000, pages 54676 and 54644-45, attached hereto as **Exhibit H**.

Claim 21 is a modified version of Watanabe patent claim 1, replacing the phrases "solid state detecting portion formed by plural solid state detector elements" and "solid state detecting portion" with the phrase "radiation receptor for electronic image storage." The claim chart attached hereto as **EXHIBIT D** demonstrates an example of support based on the same Examiner's comments, and the claim chart attached hereto as **EXHIBIT E** demonstrates an example of independent support.

Claim 22 is not constrained by the phraseology of Watanabe claim 1. The claim chart attached hereto as **EXHIBIT F** demonstrates an example of support.

Applicant submits that:

1. The claims in this continuation reissue application are entitled to the dates set forth on the cover page of the Ohlson patent -- a § 371 date and a § 102(e) date of January 28, 1997, and a Swedish priority date of July 28, 1994.
2. All of these dates are before both the U.S. filing date and the Japanese priority date of the Watanabe patent, June 17, 1998 and June 19, 1997, respectively; and
3. The subject matter of the Ohlson patent was published as PCT Publication No. W096/03077 on February 8, 1996, more than a year before the Japanese priority date stated in the Watanabe patent. A copy of WO96/03077 is attached hereto as **Exhibit I**.

Applicant submits that:

1. Ohlson should be granted priority and be declared the senior party in an interference with the Watanabe patent; and
2. Claims 1-26 of the Watanabe patent:
 - a. Correspond to, i.e., are not patentable over, each of claims 20-22 in this reissue application in view of prior art such as that of record in the Watanabe patent; and
 - b. Are not patentable to Watanabe in view of Ohlson alone, including Ohlson's PCT publication, or when combined with prior art such as that of record in Watanabe.

The Final Office Action in the prosecution of the Watanabe patent (attached hereto as **Exhibit B**) states:

The following is statement of the reasons for the indication of allowable subject matter: None of the prior art teaches or suggests employing a detector support similar to that disclosed in Ohlson where the detector can be employed with a below-table and above-table source arrangement. While individually these elements are well known, there is nothing in Ohlson to suggest modifying the support of Ohlson to accommodate these modifications.

Applicant notes, that:

1. Claim 1 in the Watanabe patent does not require **both** above-table and below-table x-ray source positions — it only recites “**at least one of**” above-table and below-table source positions, and thus can be met by prior art having only one such source;
2. Ohlson shows x-ray imaging with **both** above-table and below-table source positions (e.g., Fig. 12, where receptor 2 is horizontal and below the patient table so the beam irradiates the patient from an above-table position, as well as Fig. 17, where receptor 2 is vertical and entirely below the table so the beam irradiates a patient on a wheel chair or a standing patient’s lower extremities from a below-table position); and
3. Prior art such as Khutoryansky, et al. U.S. Patent No. 5,636,259, of record in the Watanabe patent, shows an above table x-ray tube head 112 combined with an additional, below-table x-ray tube head 182.

Applicant requests the Examiner to consider the prior art cited in the Watanabe patent, in the parent reissue application, and in commonly owned patent application Ser. No. 09/449,457 filed on November 24, 1999. Such prior art is cited on Form PTO-1449 and submitted herewith, together with a copy of the commonly owned application and the parent reissue application and the claims currently pending in each.

The Office is hereby authorized to charge any fees that may be required in connection with this communication and to credit any overpayment to our Deposit Account No. 03-3125.

If a telephone interview could advance the prosecution of this application, the Examiner is respectfully requested to call the undersigned attorney.

Entry of this communication and allowance of this application are respectfully requested.

Respectfully submitted,



Ivan S. Kavrukov, Reg. No. 25,161
Attorney for Applicant
Cooper & Dunham LLP
Tel.: (212) 278-0400

Claim 20	Ohlson patent 5,764,724
Verbatim copy of claim 1 of Watanabe U.S. Patent No. 6,155,713	Examiner's comments made in the Final Office Action dated March 3, 2000, paper no. 12, in the file history of the Watanabe patents are reproduced in quotation marks below
20. An X-ray diagnostic apparatus comprising:	imaging a patient with x-rays (title; col. 1, lines 12-17 and 34-36) is a diagnostic procedure (col. 2, line 50); the beam source, table 1 and receptor 2 and its support form such apparatus
an X-ray generating portion configured to irradiate an X-ray to a subject;	"such a source is inherently part of the system of Ohlson"
a solid state detecting portion formed by plural solid state detecting elements and configured to detect the X-ray irradiated from the X-ray generating portion and	"Ohlson discloses a solid state detector (column 8, lines 18-26)" radiation receptor 2 for electronic image storage (col. 1, lines 16-17), the statement that the development of filmless systems in which images are produced and stored electronically is particularly well suited to the inventive method (col. 8, lines 18-20), and the extended-surface receptor shown in the drawing, by necessary implication refer to a solid state detector with plural solid state elements as of the date of Ohlson
movably provided independently of the X-ray generating portion; and	the disclosed mounting is separate from any mounting for an X-ray source; see, also, col. 5, lines 1-15
a holding mechanism configured to hold the solid state detecting portion such that the solid state detecting portion is	"and a holding mechanism" [citing Figs. 12, 8, 9, 2 and 16 of Ohlson] "configured to hold the detector such that it is"
horizontally movable,	"horizontally movable (X direction in figure 12),"

pivotable on a vertical axis,	"pivotable on a vertical axis (11 in figures 8 and 9),"
pivotable on a horizontal axis which crosses the vertical axis and	"pivotable on a horizontal axis which crosses the vertical axis (positions 'E' and 'F' in figure 2)", and
rotatable about an axis which crosses the horizontal axis and is parallel to a detecting plane of the solid state detecting portion,	"rotatable about an axis which crosses the horizontal axis and is parallel to the plane of the detector (25 in figure 16.)"
wherein the X-ray generating portion comprises at least one of an X-ray generating portion for an under-table tube capable of imaging in a style of under-table tube and an X-ray generating portion for an over-table tube capable of imaging in a style of over-table tube.	<p>the claim recites at least one of ... under-table ... and ... over-table, so only one is required for support</p> <p>Ohlson discloses both: patient table 1 may be brought to different positions in relation to a ceiling-mounted tower which carries the beam source (col. 1, lines 31-33), enabling pictures to be taken with a vertical beam path ... with the patient lying down (Col. 2, lines 26-28); compare col. 1, lines 25-33, with claim 8 at col. 9, lines 19-29; beam source carried by ceiling-mounted tower is an over-table tube when imaging a patient on table 1 with receptor 2 in a position such as in Fig. 12, and is an under-table tube when imaging a standing patient's lower extremities with receptor 2 in a position below the table such as in Fig. 17 (col. 3, line 36)</p>

Office Action Summary

Application No.

09/098,986

Applicant(s)

WATANABE, NAOTO

Examiner

David P. Porta

Art Unit

2876

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- 1) ☒ Responsive to communication(s) filed on 28 January 2000.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2 and 4-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 is/are rejected.
- 7) ☒ Claim(s) 2 and 4-14 is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some * c) ☐ None of the CERTIFIED copies of the priority documents have been:
1. ☐ received.
2. ☐ received in Application No. (Series Code / Serial Number) _____.
3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

- 14) ☒ Notice of References Cited (PTO-892)
- 15) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 16) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 17) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 18) ☐ Notice of Informal Patent Application (PTO-152)
- 19) ☐ Other:

Final Office Action dated 3/3/2000
Watanabe U.S. Patent 6,155,713

Art Unit: 2876

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Ohlson (5,764,724). Ohlson discloses a solid state detector (column 8, lines 18-26) and a holding mechanism configured to hold the detector such that it is horizontally movable (X direction in figure 12), pivotable on a vertical axis (11 in figures 8 and 9), pivotable on a horizontal axis which crosses the vertical axis (positions "E" and "F" in figure 2), and rotatable about an axis which crosses the horizontal axis and is parallel to a detecting plane of the detector (25 in figure 16). While the X-ray source is not explicitly shown, such a source is inherently a part of the system of Ohlson as the detector would be worthless without a source.

Allowable Subject Matter

3. Claims 2, and 4-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
4. The following is a statement of reasons for the indication of allowable subject matter: None of the prior art teaches or suggests employing a detector support similar

Application/Control Number: 09/098,986

Art Unit: 2876

to that disclosed by Ohlson where the detector can be employed with a below-table and above-table ~~source~~ arrangement, a ceiling mount, or coordinated control of the source and detector. While individually these elements are well known, there is nothing in Ohlson to suggest modifying the support of Ohlson to accommodate these modifications.

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Gaiser et al. disclose a digital imaging device positionable in any configuration required, but fails to disclose a solid state detector overcoming the shortcomings of Ohlson.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


Application/Control Number: 09/098,986

Art Unit: 2876

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David P. Porta whose telephone number is 703-308-4852. The examiner can normally be reached on Mon-Thurs, 6:30-17:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald T. Hajec can be reached on 703-308-4075. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-305-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.


David P. Porta
Primary Examiner
Art Unit 2876

DPP
February 29, 2000

Notice of References Cited

Application/Control No.

09/098,986

Examiner

David P. Porta

Applicant(s)/Patent Under
Reexamination
WATANABE, NAOTO

Art Unit

2876

Page 1 of 1

U.S. PATENT DOCUMENTS

*		DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	DOCUMENT SOURCE **	
							APS	OTHER
<input type="checkbox"/>	A	5712482	Jan. 1998	Gaiser et al.	378	189X	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	B	5764724	Jun. 1998	Ohlson	378	177	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	C						<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	D						<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	E						<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	F						<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	G						<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	H						<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	I						<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	J						<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	K						<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	L						<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	M						<input type="checkbox"/>	<input type="checkbox"/>

FOREIGN PATENT DOCUMENTS

*		DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUBCLASS	DOCUMENT SOURCE **	
								APS	OTHER
<input type="checkbox"/>	N							<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	O							<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	P							<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Q							<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	R							<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	S							<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	T							<input type="checkbox"/>	<input type="checkbox"/>

NON-PATENT DOCUMENTS

*		DOCUMENT (Including Author, Title Date, Source, and Pertinent Pages)	DOCUMENT SOURCE **	
			APS	OTHER
<input type="checkbox"/>	U		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	V		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	W		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	X		<input type="checkbox"/>	<input type="checkbox"/>

*A copy of this reference is not being furnished with this Office action. (See Manual of Patent Examining Procedure, Section 707.05(a).)

**APS encompasses any electronic search i.e. text, image, and Commercial Databases.

U.S. Patent and Trademark Office

PTO-892 (Rev. 03-98)

Notice of References Cited

Part of Paper No. 12

Claim 20	Ohlson patent
20. An X-ray diagnostic apparatus comprising:	imaging a patient with x-rays (title; col. 1, lines 12-17 and 34-36) is a diagnostic procedure (col. 2, line 50); the beam source, table 1 and receptor 2 and its support form such apparatus
an X-ray generating portion configured to irradiate an X-ray to a subject;	radiation source for X-ray photography, etc. (col. 1, lines 18-20); beam source (col. 5, lines 1-5)
a solid state detecting portion formed by plural solid state detecting elements and configured to detect the X-ray irradiated from the X-ray generating portion and	radiation receptor 2 for electronic image storage (col. 1, lines 16-17), statement that the development of filmless systems in which images are produced and stored electronically is particularly well suited to the inventive method (col. 8, lines 18-20), and showing of an extended-surface receptor in the drawing, by necessary implication refer to a solid state detector with plural solid state elements as of the date of Ohlson
movably provided independently of the X-ray generating portion; and	table movable to different positions relative to beam source, which may be ceiling-mounted (col. 1, lines 31-33); the radiation receptor is mounted on a carriage mounted in the table (col. 4, lines 66-67; col. 6, line 64-col. 7, line 2); the beam source is movable relative to the table (col. 5, lines 1-5)
a holding mechanism configured to hold the solid state detecting portion such that the solid state detecting portion is	element 15, arm 7, arm 9, etc. (col. 6, line 65-col. 7, line 30; Figs. 12-19)
horizontally movable,	carrier and guide arrangement 15-19 (col. 6, lines 65-67; col. 7, lines 3-8 and 23-27; Figs. 12-16)

pivotable on a vertical axis,	axis 11 (col. 7, lines 17-18; Figs. 15 and 17)
pivotable on a horizontal axis which crosses the vertical axis and	axes 10 and 21 (col. 7, lines 19-23 and 36-38; Figs. 16 and 17)
rotatable about an axis which crosses the horizontal axis and is parallel to a detecting plane of the solid state detecting portion,	axis 25 (col. 7, lines 41-46; Fig. 16); the detecting plane is the plane of a major surface of receptor unit 2
wherein the X-ray generating portion comprises at least one of an X-ray generating portion for an under-table tube capable of imaging in a style of under-table tube and an X-ray generating portion for an over-table tube capable of imaging in a style of overtable tube.	patient table 1 may be brought to different positions in relation to a ceiling-mounted tower which carries the beam source (col. 1, lines 31-33), enabling pictures to be taken with a vertical beam path ... with the patient lying down (Col. 2, lines 26-28); compare col. 1, lines 25-33, with claim 8 at col. 9, lines 19-29; beam source carried by ceiling-mounted tower is an over-table tube when imaging a patient on table 1 with receptor 2 in a position such as in Fig. 12, and is an under-table tube when imaging a standing patient's lower extremities with receptor 2 in a position below the table such as in Fig. 17 (col. 3, line 36)

<p>Claim 21</p> <p>Modified version of claim 1 of Watanabe U.S. Patent No. 6,155,713, changing the phrases "a solid state detecting portion formed by plural solid state detector elements" and "solid state detecting portion" to the phrase "radiation receptor for electronic image storage"</p>	<p>Ohlson patent.</p> <p>Examiner's comments made in the Final Office Action dated March 3, 2000, paper no. 12, in the file history of the Watanabe patent are in quotation marks below</p>
<p>21. An X-ray diagnostic apparatus comprising:</p>	<p>imaging a patient with x-rays (title; col. 1, lines 12-17 and 34-36) is a diagnostic procedure (col. 2, line 50); the beam source, table 1 and receptor 2 and its support form such apparatus</p>
<p>an X-ray generating portion configured to irradiate an X-ray to a subject;</p>	<p>"such a source is inherently part of the system of Ohlson"</p>
<p>a radiation receptor for electronic image storage and configured to detect the X-ray irradiated from the X-ray generating portion and</p>	<p>"Ohlson discloses a solid state detector (column 8, lines 18-26)"</p>
<p>movably provided independently of the X-ray generating portion; and</p>	<p>the disclosed mounting is clearly separate from any mounting for an X-ray source. See, also, col. 5, lines 1-15.</p>
<p>a holding mechanism configured to hold the radiation receptor for electronic image storage such that the radiation receptor for electronic image storage is</p>	<p>"and a holding mechanism" [citing Figs. 12, 8, 9, 2 and 16 of Ohlson] "configured to hold the detector such that it is"</p>
<p>horizontally movable,</p>	<p>"horizontally movable (X direction in figure 12),"</p>
<p>pivotable on a vertical axis,</p>	<p>"pivotable on a vertical axis (11 in figures 8 and 9),"</p>
<p>pivotable on a horizontal axis which crosses the vertical axis and</p>	<p>"pivotable on a horizontal axis which crosses the vertical axis (positions 'E' and 'F' in figure 2)", and</p>

<p>rotatable about an axis which crosses the horizontal axis and is parallel to a detecting plane of the radiation receptor for electronic image storage,</p>	<p>"rotatable about an axis which crosses the horizontal axis and is parallel to the plane of the detector (25 in figure 16.)"</p>
<p>wherein the X-ray generating portion comprises at least one of an X-ray generating portion for an under-table tube capable of imaging in a style of under-table tube and an X-ray generating portion for an over-table tube capable of imaging in a style of over-table tube.</p>	<p>patient table 1 may be brought to different positions in relation to a ceiling-mounted tower which carries the beam source (col. 1, lines 31-33), enabling pictures to be taken with a vertical beam path ... with the patient lying down (Col. 2, lines 26-28); compare col. 1, lines 25-33, with claim 8 at col. 9, lines 19-29; beam source carried by ceiling-mounted tower is an over-table tube when imaging a patient on table 1 with receptor 2 in a position such as in Fig. 12, and is an under-table tube when imaging a standing patient's lower extremities with receptor 2 in a position below the table such as in Fig. 17 (col. 3, line 36)</p>

Claim 21	Ohlson patent.
21. An X-ray diagnostic apparatus comprising:	imaging a patient with x-rays (title; col. 1, lines 12-17 and 34-36) is a diagnostic procedure (col. 2, line 50); the beam source, table 1 and receptor 2 and its support form such apparatus
an X-ray generating portion configured to irradiate an X-ray to a subject;	radiation source for X-ray photography, etc. (col. 1, lines 18-20); beam source (col. 5, lines 1-5)
a radiation receptor for electronic image storage and configured to detect the X-ray irradiated from the X-ray generating portion and	radiation receptor 2 for electronic image storage (col. 1, lines 16-17), statement that the development of filmless systems in which images are produced and stored electronically is particularly well suited to the inventive method (col. 8, lines 18-20), and showing of an extended-surface receptor in the drawing, by necessary implication refer to a solid state detector with plural solid state elements as of the date of Ohlson
movably provided independently of the X-ray generating portion; and	table movable to different positions relative to beam source, which may be ceiling-mounted (col. 1, lines 31-33); receptor mounted on a carriage mounted in the table (col. 4, lines 66-67; col. 6, line 64-col. 7, line 2); beam source movable relative to table (col. 5, lines 1-5)
a holding mechanism configured to hold the beam sensing portion such that the beam sensing portion is	element 15, arm 7, arm 9, etc. (col. 6, line 65-col. 7, line 30; Figs. 12-19)
horizontally movable,	carrier and guide arrangement 15-19 (col. 6, lines 65-67; col. 7, lines 3-8 and 23-27; Figs. 12-16)
pivotal on a vertical axis,	axis 11 (col. 7, lines 17-18; Figs. 15 and 17)

pivotable on a horizontal axis which crosses the vertical axis and	axes 10 and 21 (col. 7, lines 19-23 and 36-38; Figs. 16 and 17)
rotatable about an axis which crosses the horizontal axis and is parallel to a detecting plane of the beam sensing portion,	axis 25 (col. 7, lines 41-46; Fig. 16); the detecting plane is the plane of a major surface of receptor unit 2
wherein the X-ray generating portion comprises at least one of an X-ray generating portion for an under-table tube capable of imaging in a style of under-table tube and an X-ray generating portion for an over-table tube capable of imaging in a style of overtable tube.	patient table 1 may be brought to different positions in relation to a ceiling-mounted tower which carries the beam source (col. 1, lines 31-33), enabling pictures to be taken with a vertical beam path ... with the patient lying down (Col. 2, lines 26-28); compare col. 1, lines 25-33, with claim 8 at col. 9, lines 19-29; beam source carried by ceiling-mounted tower is an over-table tube when imaging a patient on table 1 with receptor 2 in a position such as in Fig. 12, and is an under-table tube when imaging a standing patient's lower extremities with receptor 2 in a position below the table such as in Fig. 17 (col. 3, line 36)

Claim 22	Ohlson patent.
22. An X-ray system comprising:	title; col. 1, lines 12-17 and 34-36
a patient table and an X-ray beam source movable in an x-direction, a y-direction, and a z-direction, and rotatable about a horizontal axis relative to the patient table;	title; col. 5, lines 1-5; patient table 1
a radiation receptor for electronic image storage comprising a filmless system in which X-ray images are produced and stored electronically, said radiation receptor having a detecting plane and being configured to detect X-rays from said X-ray beam source and	radiation receptor 2; title; col. 1, lines 12-17 and 34-36; col. 8, lines 18-21
movably provided independently of the X-ray beam source; and	the disclosed mounting of receptor 2 is separate from the X-ray beam source; see, also, col. 5, lines 1-15 and 31-33; col. 4, lines 66-67; col. 6, line 64; col. 7, line 2; col. 5, lines 1-5
a holding mechanism configured to hold the radiation receptor such that the radiation receptor is	element 15, arm 7, arm 9, etc. (col. 6, line 65-col. 7, line 30; Figs. 12-19)
horizontally movable,	carrier and guide arrangement 15-19 (col. 6, lines 65-67; col. 7, lines 3-8 and 23-27; Figs. 12-16)
pivotable on a vertical axis,	axis 11 (col. 7, lines 17-18; Figs. 15 and 17)
pivotable on a horizontal axis which crosses the vertical axis and	axes 10 and 21 (col. 7, lines 19-23 and 36-38; Figs. 16 and 17)
rotatable about an axis which crosses the horizontal axis and is parallel to the detecting plane of the radiation receptor,	axis 25 (col. 7, lines 41-46; Fig. 16); the detecting plane is the plane of a major surface of receptor unit 2

<p>wherein the X-ray beam source comprises an X-ray beam source for selectively imaging a patient from above the table when the patient is lying down on the table and from below the table when the radiation receptor is below the table.</p>	<p>patient table 1 may be brought to different positions in relation to a ceiling-mounted tower which carries the beam source (col. 1, lines 31-33), enabling pictures to be taken with a vertical beam path ... with the patient lying down (Col. 2, lines 26-28); compare col. 1, lines 25-33, with claim 8 at col. 9, lines 19-29; beam source carried by ceiling-mounted tower is an over-table tube when imaging a patient on table 1 with receptor 2 in a position such as in Fig. 12, and is an under-table tube when imaging a standing patient's lower extremities with receptor 2 in a position below the table such as in Fig. 17 (col 3, line 36)</p>
---	---

(f) *Amendment of disclosure may be required.* The disclosure must be amended, when required by the Office, to correct inaccuracies of description and definition, and to secure substantial correspondence between the claims, the remainder of the specification, and the drawings.

(g) *Amendments made relative to the patent.* All amendments must be made relative to the patent specification, including the claims, and drawings, which are in effect as of the date of filing of the reissue application.

§ 1.174 [Reserved]

60. Section 1.174 is removed and reserved.

61. Section 1.176 is revised to read as follows:

§ 1.176 Examination of reissue.

(a) A reissue application will be examined in the same manner as a non-reissue, non-provisional application, and will be subject to all the requirements of the rules related to non-reissue applications. Applications for reissue will be acted on by the examiner in advance of other applications.

(b) Restriction between subject matter of the original patent claims and previously unclaimed subject matter may be required (restriction involving only subject matter of the original patent claims will not be required). If restriction is required, the subject matter of the original patent claims will be held to be constructively elected unless a disclaimer of all the patent claims is filed in the reissue application, which disclaimer cannot be withdrawn by applicant.

62. Section 1.177 is revised to read as follows:

§ 1.177 Issuance of multiple reissue patents.

(a) The Office may reissue a patent as multiple reissue patents. If applicant files more than one application for the reissue of a single patent, each such application must contain or be amended to contain in the first sentence of the specification a notice stating that more than one reissue application has been filed and identifying each of the reissue applications by relationship, application number and filing date. The Office may correct by certificate of correction under § 1.322 any reissue patent resulting from an application to which this paragraph applies that does not contain the required notice.

(b) If applicant files more than one application for the reissue of a single patent, each claim of the patent being reissued must be presented in each of the reissue applications as an amended,

unamended, or canceled (shown in brackets) claim, with each such claim bearing the same number as in the patent being reissued. The same claim of the patent being reissued may not be presented in its original unamended form for examination in more than one of such multiple reissue applications. The numbering of any added claims in any of the multiple reissue applications must follow the number of the highest numbered original patent claim.

(c) If any one of the several reissue applications by itself fails to correct an error in the original patent as required by 35 U.S.C. 251 but is otherwise in condition for allowance, the Office may suspend action in the allowable application until all issues are resolved as to at least one of the remaining reissue applications. The Office may also merge two or more of the multiple reissue applications into a single reissue application. No reissue application containing only unamended patent claims and not correcting an error in the original patent will be passed to issue by itself.

63. Section 1.178 is revised to read as follows:

§ 1.178 Original patent; continuing duty of applicant.

(a) The application for a reissue should be accompanied by either an offer to surrender the original patent, or the original patent itself, or if the original is lost or inaccessible, by a statement to that effect. The application may be accepted for examination in the absence of the original patent or the statement, but one or the other must be supplied before the application is allowed. If a reissue application is refused, the original patent, if surrendered, will be returned to applicant upon request.

(b) In any reissue application before the Office, the applicant must call to the attention of the Office any prior or concurrent proceedings in which the patent (for which reissue is requested) is or was involved, such as interferences, reissues, reexaminations, or litigations and the results of such proceedings (see also § 1.173(a)(1)).

64. Section 1.181 is amended by revising paragraph (f) to read as follows:

§ 1.181 Petition to the Commissioner.

(f) The mere filing of a petition will not stay any period for reply that may be running against the application, nor act as a stay of other proceedings. Any petition under this part not filed within two months of the mailing date of the action or notice from which relief is requested may be dismissed as

untimely, except as otherwise provided. This two-month period is not extendable.

65. Section 1.193 is amended by revising paragraph (b)(1) to read as follows:

§ 1.193 Examiner's answer and reply brief.

(b)(1) Appellant may file a reply brief to an examiner's answer or a supplemental examiner's answer within two months from the date of such examiner's answer or supplemental examiner's answer. See § 1.136(b) for extensions of time for filing a reply brief in a patent application and § 1.550(c) for extensions of time for filing a reply brief in a reexamination proceeding. The primary examiner must either acknowledge receipt and entry of the reply brief or withdraw the final rejection and reopen prosecution to respond to the reply brief. A supplemental examiner's answer is not permitted, unless the application has been remanded by the Board of Patent Appeals and Interferences for such purpose.

66. Section 1.303 is amended by revising paragraph (a) to read as follows:

§ 1.303 Civil action under 35 U.S.C. 145, 146, 306.

(a) Any applicant or any owner of a patent involved in a reexamination proceeding dissatisfied with the decision of the Board of Patent Appeals and Interferences, and any party to an interference dissatisfied with the decision of the Board of Patent Appeals and Interferences may, instead of appealing to the U.S. Court of Appeals for the Federal Circuit (§ 1.301), have remedy by civil action under 35 U.S.C. 145 or 146, as appropriate. Such civil action must be commenced within the time specified in § 1.304.

67. Section 1.311 is amended by revising paragraph (b) to read as follows:

§ 1.311 Notice of allowance.

(b) An authorization to charge the issue fee (§ 1.18) to a deposit account may be filed in an individual application only after the mailing of the notice of allowance. The submission of either of the following after the mailing of a notice of allowance will operate as a request to charge the correct issue fee to any deposit account identified in a previously filed authorization to charge fees:

(1) An incorrect issue fee; or

Section 1.174: Section 1.174 is removed (and reserved) in view of the inclusion of all filing and amendment requirements for reissue drawings in amended § 1.173. Thus, in addition to the reissue filing requirements of former § 1.173, the reissue amendment requirements of former § 1.121(b) and the reissue drawing requirements of former § 1.174 are all included in a single rule, amended § 1.173. The changes consolidating several former rules into a single rule should make the requirements for all reissue filings and amendments quicker to locate and easier to understand.

Section 1.176: Section 1.176 is amended to create §§ 1.176(a) and (b). Section § 1.176(a) contains material retained from the former rule, while § 1.176(b) contains new material permitting certain restrictions.

Section 1.176 is amended to eliminate the prohibition against requiring division in a reissue application. The Federal Circuit has indicated that 35 U.S.C. 251 does not, under certain circumstances, prohibit an applicant in a reissue application from adding claims directed to an invention which is separate and distinct from the invention defined by the original patent claims. See *In re Amos*, 953 F.2d 613, 21 USPQ2d 1271 (Fed. Cir. 1991). Former § 1.176, however, prohibited the Office from making a restriction requirement in a reissue application. This prohibition in former § 1.176, in combination with the Federal Circuit's decision in *Amos*, frequently placed an unreasonable burden on the Office in requiring the examination of multiple inventions in a single reissue application.

Elimination of the prohibition against restriction in divisional application under § 1.176 is effective for reissue applications filed on or after the date that is sixty days after the date of publication in the Federal Register.

Section 1.176(b) now allows the Office to make a restriction requirement in a reissue application between claims added in a reissue application and the original patent claims, where the added claims are directed to an invention which is separate and distinct from the invention(s) defined by the original patent claims. The criteria for making a restriction requirement in a reissue application between added claims and original patent claims is the same as that applied in an original application. See MPEP 806 through 806.05(i). Where a restriction requirement is made, the original patent claims will be held to be constructively elected and the examiner will issue an Office action on the merits

providing notification of the restriction requirement in such Office action.

If a requirement for restriction between the claims of the original patent and those added claims which are directed towards previously unclaimed subject matter is made by the examiner, the group containing the original patent claims (amended or unamended) will be held to be constructively elected, unless a disclaimer of all the patent claims is filed in the reissue application, which disclaimer cannot be withdrawn by applicant.

The original patent claims (which have been constructively elected) will receive a complete examination on their merits, while the nonelected (added) claims (to any added invention(s)) will be held in abeyance in a withdrawn status. These nonelected (added) claims will only be examined if filed in a divisional reissue application. If the reissue application contains only original unamended claims and is found to be allowable, further action in the reissue application may have to be suspended, since the Office will not allow a reissue patent which does not correct any error in the original patent. If the divisional reissue application containing the added claims is examined and is found to be allowable, the Office may recombine the several sets of examined and allowable claims into one of the reissue applications, which then can be allowed. See the discussion of § 1.177 for additional details for presenting multiple reissue applications.

The Office is requiring a constructive election of the original (patented) claims to ensure that the original (patented) claims receive an examination on their merits. If a reissue applicant was permitted to elect the added claims directed toward previously unclaimed subject matter, and, after an examination of only these added claims, the divisional claims were determined to be unpatentable, applicant would most likely let the reissue application go abandoned and not file a divisional reissue application directed toward the original claims of the patent. In this circumstance, no examination of the original claims of the patent would be made. This would not be appropriate as the filing of the reissue application would mandate that the original patent claims be reevaluated/examined again. Thus, a constructive election of the original patent claims and an examination thereof in the first reissue application would force the applicant to file a divisional reissue application with claims to the added invention in order

to secure an examination of such added claims.

The Office will continue to not require restriction among original claims of the patent (i.e., among claims that were in the patent prior to filing the reissue application) and the rule has been amended to reflect that practice. In order for restriction to be required between the original patent claims and added claims, the added claims must be directed toward inventions which are separate and distinct from the invention(s) defined by the original patent claims. Restriction between multiple inventions in the added claims will be permitted provided the added claims are drawn to several separate and distinct inventions.

Section 1.176 has been further amended to delete the two-month portion of the rule relating to when a reissue application will be acted upon. When any particular reissue application is taken up for action is an internal Office policy that need not be set forth in the rules of practice. Moreover, it is the intent of the Office to consider acting on divisional reissue applications prior to expiration of the two-month period after announcement of the reissue filing in the *Official Gazette*.

The amendments to this section are not intended to affect the types of errors that are or are not appropriate for correction under 35 U.S.C. 251 (e.g., applicant's failure to timely file a divisional application is not considered to be the type of error that can be corrected by a reissue). See *In re Watkinson*, 900 F.2d 230, 14 USPQ2d 1407 (Fed. Cir. 1990); *In re Mead*, 581 F.2d 251, 198 USPQ 412 (CCPA 1978); and *In re Orita*, 550 F.2d 1277, 193 USPQ 145 (CCPA 1977).

Section 1.177: The title to § 1.177 has been amended to read "Issuance of multiple reissue patents" in order to include procedures pertaining to continuation reissue applications as well as divisional reissue applications.

Section 1.177 is amended to eliminate former requirements that divisional reissues be limited to separate and distinct parts of the thing patented, and that they be issued simultaneously unless ordered by the Commissioner. The rule is expanded to include continuations of reissues as well as divisionals. See *In re Graff*, 111 F.3d 874, 876-77, 42 USPQ2d 1471, 1473 (Fed. Cir. 1997). The Federal Circuit specifically stated:

[35 U.S.C. 251, ¶ 3.] provides that the general rules for patent applications apply also to reissue applications, and [35 U.S.C. 251, ¶ 2.] expressly recognizes that there may be more than one reissue patent for distinct and separate parts of the thing patented. [35

U.S.C. 251] does not prohibit divisional or continuation reissue applications, and does not place stricter limitations on such applications when they are presented by reissue, provided of course that the statutory requirements specific to reissue applications are met. See [35 U.S.C. 251, ¶ 3]

[35 U.S.C. 251, ¶ 2.] is plainly intended as enabling, not limiting. [35 U.S.C. 251, ¶ 2.] has the effect of assuring that a different burden is not placed on divisional or continuation reissue applications, compared with divisions and continuations of original applications, by codifying [*The Corn-Planter Patent*, 90 U.S. 181 (1874).] which recognized that more than one patent can result from a reissue proceeding. Thus, [35 U.S.C. 251, ¶ 2.] places no greater burden on [a] continuation reissue application than upon a continuation of an original application; [35 U.S.C. 251, ¶ 2.] neither overrides, enlarges, nor limits the statement in [35 U.S.C. 251, ¶ 3.] that the provisions of Title 35 apply to reissues.

See *id.* at 876–77, 42 USPQ2d at 1473.

Thus, the Federal Circuit has indicated that a continuation or divisional reissue application is not subject to any greater burden other than the burden imposed by 35 U.S.C. 120 and 121 on a continuation or divisional non-reissue application, except that a continuation or divisional reissue application must also comply with the statutory requirements specific to reissue applications (e.g., the “error without any deceptive intention” requirement of 35 U.S.C. 251, ¶ 1).

Following *Graff*, the Office has adopted a policy of treating continuations/divisionals of reissue applications in much the same manner as continuations/divisionals of non-reissue applications. Accordingly, the former requirements of § 1.177 as to petitioning for non-simultaneous issuance of multiple reissue patents, suspending prosecution in an allowable reissue application while the other is prosecuted, and limiting the content of each reissue application to separate and distinct parts of the thing patented, are all eliminated. These requirements were considered unique to reissue continuations/divisionals, imposed additional burdens on reissue applicants, and are now inconsistent with the Federal Circuit’s discussion of 35 U.S.C. 251, ¶ 2, in *Graff*.

The changes to § 1.177 relating to divisional reissues are effective on the date of publication of the rule in the *Federal Register* for all pending and new reissue applications.

Additionally, § 1.177(a) is amended to require that all multiple reissue applications of a single patent include as the first line of the respective specifications a cross-reference to the other reissue application(s). The cross-

reference will provide the public with notice that more than one reissue application has been filed to correct an error (or errors) in a single patent. If one reissue has already issued without the appropriate cross-reference, a certificate of correction will be issued to provide the cross-reference in the issued reissue patent. The Office will initiate a certificate of correction under § 1.322 to include the appropriate cross-reference in the already issued first reissue patent before passing the pending reissue application to issue.

Section 1.177(b) is amended to require that all of the claims of the patent be presented in each application as amended, unamended or canceled, and that the same claim not be presented for examination in more than one application in its original unamended version. Any added claims must be numbered beginning with the next highest number following the last patent claim.

If the same or similar claims are presented in more than one of the multiple reissue applications, statutory double patenting (35 U.S.C. 101) or non-statutory (judicially created doctrine) double patenting may be considered by the examiner during examination, and appropriate rejections will be made. If needed to overcome the rejections, terminal disclaimers will be required in order to ensure common ownership of any non-distinct claims throughout each of the patents’ lifetimes.

Amendments are concurrently made to permit restriction in reissue applications between the original patent claims and any added claims to separate and distinct subject matter (see change to § 1.176). If one or more divisional applications are filed after such a restriction requirement, § 1.177(c) provides that the resulting multiple reissue applications will be issued alone or together, but each of the reissue applications will be required to include changes which correct an error in the original patent before it can be issued as a reissue patent. If one of the applications resulting from the restriction requirement is found to be allowable without any changes relative to the patent (i.e., it includes only all the original patent claims), further action will be suspended until one other reissue application becomes allowable; then, the two will be recombined and issued as a single reissue patent. If the several reissue applications resulting from the restriction each include changes correcting some error in the original patent, the reissue applications could be issued separately, with an appropriate cross-reference to the

other(s) in each of the respective specifications.

Section 1.178: The title of § 1.178 is amended to reflect the addition of the material in new § 1.178(b), and the rule is amended to create § 1.178(a) containing some of the material in the former rule, and § 1.178(b).

Section 1.178(a) is amended to no longer require an offer to surrender the original patent at the time of filing as part of the reissue application filing requirements. Omission of this formality by applicants in the past has resulted in processing delays due to the Office’s sending of a Notice to File Missing Parts of Application. The change to this section relaxes the former requirement and permits examination to commence without the “offer” to surrender the original patent. The requirement for actual surrender of the original patent (or a “statement” of its loss, as set out below) before the reissue application is allowed, however, is retained.

Section 1.178(a) is also amended to change “affidavit or declaration” (attesting to the loss or inaccessibility of the original patent) to “statement.” This change will eliminate the verification requirements of the former rule, which are formalities covered by §§ 1.4 and 10.18.

Replacement in § 1.178(a) of the oath or declaration with a statement that the original patent is lost or inaccessible is effective on the date of publication in the *Federal Register* for all pending or new reissue applications.

Section 1.178(b) has been added to require reissue applicants to call to the attention of the Office any prior or concurrent proceeding in which the patent (for which reissue is requested) is or was involved, such as interferences, reissues, reexaminations, or litigation (litigation covers any papers filed in the court or issued by the court, such as, for example, motions, pleadings, and court decisions including court orders) and the results of such proceedings. The duty to submit such information is a continuing duty and runs from the time the reissue application is filed until the reissue application is abandoned or issues as a reissue patent. The addition of § 1.178(b) is intended to further the Office’s desire to make consistent both reissue and reexamination proceedings as much as possible (see §§ 1.565(a) and (b)). See also § 1.173(a)(1).

The need to call the attention of the Office to prior or concurrent proceedings in which the patent (for which reissue is requested) is or was involved applies to pending and new reissue applications.

Section 1.181: Section 1.181 provides generically for petitions to the



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : A61B 6/04, 6/00, H05G 1/02	A1	(11) International Publication Number: WO 96/03077
		(43) International Publication Date: 8 February 1996 (08.02.96)

(21) International Application Number: PCT/SE95/00887

(22) International Filing Date: 26 July 1995 (26.07.95)

(30) Priority Data:
9402589-7 28 July 1994 (28.07.94) SE

(71) Applicant (for all designated States except US): AO MEDICAL PRODUCTS AB [SE/SE]; P.O. Box 19045, S-104 32 Stockholm (SE).

(72) Inventor; and

(75) Inventor/Applicant (for US only): OHLSON, Carl-Eric [SE/SE]; Östermalmmsgatan 7, S-115 24 Stockholm (SE).

(74) Agents: WENNBORG, Göte et al.; Kransell & Wennborg AB, P.O. Box 27834, S-115 93 Stockholm (SE).

(81) Designated States: AU, FI, JP, KR, NO, US, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

Published

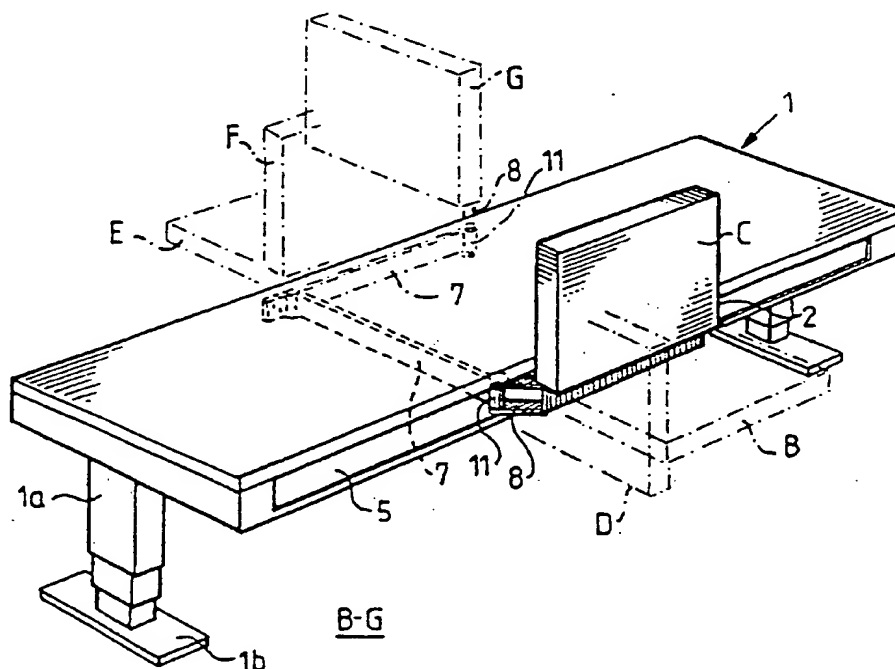
With international search report.

In English translation (filed in Swedish).

(54) Title: A METHOD OF MAKING X-RAY PHOTOGRAPHS OR EXPOSURES OR OTHER TYPE OF RADIATION SENSING, SUCH AS ELECTRONIC IMAGE STORAGE, AND A PATIENT TABLE HAVING A RECEPTOR UNIT FOR SUCH PHOTOGRAPHY, EXPOSURE OR IMAGE STORAGE

(57) Abstract

A method of X-ray photography or a method of some other type of radiation sensing, such as electronic image storage, employs the use of a receptor unit (2) which can be swung outwards and upwards from an initial position in or beneath a patient support table (1) about alternative pivot centres (11, 12) disposed in the region of respective side edges of the table to alternative positions for operating with a horizontal beam path. The receptor unit can be swung out about a vertical axis from these positions in which it is parallel with the longitudinal direction of the table to a position in which the unit is perpendicular to the longitudinal axis of the table, to enable pictures to be taken of a patient seated in a wheelchair, for instance. The invention also relates to a patient support table (1) provided with a receptor unit (2) of this kind.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	GB	United Kingdom	MR	Mauritania
AU	Australia	GE	Georgia	MW	Malawi
BB	Barbados	GN	Guinea	NE	Niger
BE	Belgium	GR	Greece	NL	Netherlands
BF	Burkina Faso	HU	Hungary	NO	Norway
BG	Bulgaria	IE	Ireland	NZ	New Zealand
BJ	Benin	IT	Italy	PL	Poland
BR	Brazil	JP	Japan	PT	Portugal
BY	Belarus	KE	Kenya	RO	Romania
CA	Canada	KG	Kyrgyzstan	RU	Russian Federation
CF	Central African Republic	KP	Democratic People's Republic of Korea	SD	Sudan
CG	Congo	KR	Republic of Korea	SE	Sweden
CH	Switzerland	KZ	Kazakhstan	SI	Slovenia
CI	Côte d'Ivoire	LI	Liechtenstein	SK	Slovakia
CM	Cameroon	LK	Sri Lanka	SN	Senegal
CN	China	LU	Luxembourg	TD	Chad
CS	Czechoslovakia	LV	Latvia	TG	Togo
CZ	Czech Republic	MC	Monaco	TJ	Tajikistan
DE	Germany	MD	Republic of Moldova	TT	Trinidad and Tobago
DK	Denmark	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	US	United States of America
FI	Finland	MN	Mongolia	UZ	Uzbekistan
FR	France			VN	Viet Nam
GA	Gabon				

A METHOD OF MAKING X-RAY PHOTOGRAPHS OR EXPOSURES OR OTHER
TYPE OF RADIATION SENSING, SUCH AS ELECTRONIC IMAGE
STORAGE, AND A PATIENT TABLE HAVING A RECEPTOR UNIT
FOR SUCH PHOTOGRAPHY, EXPOSURE OR IMAGE STORAGE

5

TECHNICAL FIELD

The present invention relates to a method of imaging a person
or an object in at least two directions by X-ray photography,
10 while using an X-ray cassette as a receptor or other forms
of radiation-absorbing techniques with the aid of a radiation
receptor, for instance for electronic image storage.

In imaging processes of this kind, there is used a radiation
15 source which is supported for movement in X-, Y- and Z-
directions and which is rotatable about a horizontal axis.
The receptor unit may be mounted in or positioned beneath a
patient table and is movable in the X-direction. Movement of
the radiation source may be initiated automatically, as the
20 receptor unit is moved.

By X-direction is meant here and in the following a direction
of movement which is parallel with one long side of the
patient table, while by Y-direction is meant a direction of
25 movement perpendicular to the extension of said long side,
i.e. a direction of movement parallel with the short sides
of the table. By Z-direction is meant movement in a vertical
direction. This enables the patient table to be brought to
different positions in relation to a tower column or a
30 ceiling-mounted tower which carries the beam source.

The present invention also relates to a patient table
equipped with a receptor unit, and more specifically to a
patient table of the kind defined in the preamble of Claim
35 5.

BACKGROUND PRIOR ART

5 GB-B-1,323,769 (Picker Corp.) describes apparatus comprising a receptor part disposed in a patient support table, and an overlying ceiling-mounted beam source. The apparatus enables side-on photographs to be taken with a horizontal beam path, by swinging-up the patient's support table about a horizontal axis and pivoting the beam source. The apparatus also enables the image size and the shutter setting to be varied in relation to the beam-source/receptor distance ("SID", i.e. "source-image-distance". However, movement of the beam source and swinging of the patient support table must be effected manually, which is experienced as troublesome by the radiologists concerned.

15 EP-A-0 430 934 (AO Medical Products) describes a method of the aforesaid kind in which activation of a secondary receptor pivotally associated with the receptor unit or mountable thereon and extending in a vertical plane results, optionally after a time delay, in automatic movement of the beam source to a basic setting for horizontal, centered beam path onto the secondary receptor.

25 A Philips brochure describes a patient support table which carries a receptor unit for a vertical beam path. This receptor unit can be swung outwards and upwards from one side of the table, to a position for receiving a horizontal beam path.

30 This latter arrangement, which is considered to represent the nearest prior art, has a number of drawbacks. When the receptor unit is to be swung out and up to receive a horizontal beam path, it is necessary for personnel who need to stand on the other side of the table in order to manoeuvre the beam source to move around the table to swing the receptor unit outwards and upwards, and then move back around the table and place themselves in their original position in

35

which the beam source can be manoeuvred. This procedure is experienced by the personnel as being both troublesome and time-consuming. The described solution also has other drawbacks from an ergometric aspect.

5 Another drawback is that the receptor unit is not centred in relation to the beam path when swung outwards and upwards from the table, and it is therefore necessary to move the beam source in the X-direction when adjusting for horizontal
10 beam path.

Furthermore, this known arrangement only allows an exposure to be taken from one side of the patient. It is often difficult to "turn" the patient, particularly when the
15 patient is seriously injured.

The effect of these drawbacks may sometimes be so serious as to impair the clarity of the pictures to an extent such as to require the X-ray to be taken again, therewith exposing
20 the patient to an unnecessarily high radiation dosage.

THE OBJECTS OF THE INVENTION

One object of the invention is to provide a method and a
25 patient support table of the aforedefined kind which, with one and the same receptor equipment, enables pictures to be taken with a vertical beam path, for instance with the patient lying down, and also with a horizontal beam path from each side of the patient support table, and preferably
30 without changing the setting of the beam source in the X-direction, i.e. without moving the beam source laterally.

Another object is to provide equipment of the aforesaid kind which is superior to earlier known equipment with regard to
35 ergometrics.

A further object of the invention is to provide equipment

which can be adapted readily to different specific parameters, such as receptor size, table width, etc.

BRIEF DESCRIPTION OF THE INVENTION

5 These and other objects are fulfilled with a method of the kind defined in the preamble of Claim 1 and having the features set forth in the characterizing clause of said Claim.

10 The invention enables the beam to be kept central in the Y-direction in the transition between a vertical and a horizontal beam path, irrespective of the alignment of the horizontal beam path in the Y-direction. In addition, the invention
15 enables a receptor that has been swung up to a position above the table to be moved towards the patient and therewith obtain optimum picture sharpness and therewith a clearer diagnosis from the picture or image obtained.

20 The invention also enables the positions of pivot centres to be determined accurately in accordance with the different parameters that apply in individual cases, for instance in accordance with the dimensions of the receptor unit, the width of the patient support table, the desire for the bottom
25 edge of the receptor to be located at a given height above the table when the receptor is in an outwardly swung position, and so on.

30 The present invention also enables the introduction of mutually dependent locking facilities with a crosswise function for outward swinging of the receptor unit in the horizontal plane. The effect afforded by the invention can be likened to the hinge of a hinged door, i.e. the receptor can present alternative pivot centres in dependence on the
35 direction in which the receptor unit is swung outwards. Left and right pivot centres can be readily adapted to occurrent types of tables.

In practice, it is preferred that respective pivot centres are so placed in the X- and Y-directions that centering of the beam source in the X-direction will be the same for both a horizontal and a vertical beam path. A preferred method according to the invention is characterized by swinging the receptor unit in one or both of the alternative outwardly and upwardly swung positions to a position in which the unit is perpendicular to the longitudinal axis of the table, thereby enabling X-ray pictures to be taken of a patient seated in a wheelchair, for instance.

This enables the requirement of a separate frame or stand for taking such pictures to be dispensed with. This special outwardly swung position of the receptor unit may also be used in other circumstances, for instance when taking lung X-rays, etc.

In one preferred method of applying the invention, the receptor unit is movable in the X-direction along the longitudinal axis of the table with corresponding automatic movement of the beam source and resetting of said source for a horizontal beam path towards the receptor unit, after having swung the receptor unit outwardly and upwardly beyond a side edge of the table.

Thus, in the case of this preferred method of application, the beam source is adjusted automatically to the position adopted by the receptor unit.

In accordance with one method of application, the receptor unit is supported by a carriage which can move in the X-direction relative to the table and which can also be moved in the Y-direction relative to the carriage. The unit is carried by arms whose lengths can be adjusted and which supports the unit stably and reliably.

In this method of application, the receptor unit can be

dropped down or raised up from an outwardly swung horizontal position on each side of the table, to a respective vertical position beneath or above the table, by pivotal movement about mutually parallel axles located at different levels.

5

When in an outwardly swung and upwardly lifted vertical position, the receptor unit can be swung about a central, vertical axle for work with an angled beam path.

10

According to another aspect, the invention also relates to a patient support table provided with a receptor unit and intended for X-ray photography or X-ray exposure or some other type of beam sensing, e.g. electronic image storage, said patient support table being characterized essentially

15

by the features set forth in the following Claims 8-16.

BRIEF DESCRIPTION OF THE DRAWINGS

20

The invention will now be described in more detail with reference to exemplifying embodiments thereof and also with reference to the accompanying drawings, in which

25

Fig. 1 is a perspective view of a receptor unit which can be swung outwardly and upwardly in different directions in accordance with the invention and which is mounted on a patient support table shown in chain lines;

30

Fig. 2 is a perspective view of the patient support table shown in Fig. 1 with the receptor unit in an outwardly and upwardly swung position, referenced C, to the right of the patient table, wherein the Figure also shows a number of possible alternative positions of the receptor unit, referenced B, D, E, F and G respectively, wherein the initial position shown in Fig. 1 is referenced A;

35

Figs. 3-9 show the patient support table from above with

respective receptor units in the aforesaid different positions, wherein Fig. 3 corresponds to positions A, Fig. 4 corresponds to position B, Fig. 5 corresponds to position C, Fig. 6 corresponds to position D, Fig. 7 corresponds to position E, Fig. 8 corresponds to position F and Fig. 9 corresponds to position G;

Fig. 10 is a view of the patient support table shown in the other Figures from above, with the receptor unit shown in positions A and B, wherein the Figure also shows a number of reference signs relating to different relevant measurements and distances regarding the patient support table and the receptor unit respectively as explained in more detail below, and wherein the figure thus illustrates the geometric relationship between occurrent magnitudes;

Fig. 11 is a side view illustrating different receptor positions;

Fig. 12 is a simplified principle perspective view of a modified design of the patient support table, in which the receptor unit is accommodated in a carriage which can be moved along the table in the X-direction and is so mounted in the carriage as to be also movable in the Y-direction;

Fig. 13 is a perspective exploded view illustrating some of the elements by means of which the receptor unit is supported by the carriage for movement in the Y-direction;

Fig. 14 is a perspective view of the table and the carriage-supported receptor unit in a position in which the unit lies partially outside the table, i.e. prior to swinging the receptor unit outwards;

Fig. 15 is a perspective view corresponding to the view of Fig. 14 and shows the receptor unit swung out away from the

table;

Fig. 16 is a perspective view corresponding to the view of Fig. 15 but showing the receptor unit swung to a vertical position;

Fig. 17 is a perspective view of the arrangement shown in Figs. 12-16, wherein the receptor unit has been swung down to a vertical position about an axle which is parallel with the axle used to swing-up the unit, this downwardly swung position being used, for instance, to take X-rays of the knees of a seated patient;

Fig. 18 is a perspective view of parts of those elements which function in the linear and pivotal movements of the receptor unit;

Fig. 19 is a perspective view showing that the receptor unit can be swung about a vertical axle relative to its carrying means, so as to enable pictures to be taken with an angled beam path; and

Fig. 20 is a perspective principle view illustrating some of those positions to which the receptor unit can be adjusted by means of the carrying and journalling arrangement shown in Figs. 12-19.

DESCRIPTION OF PREFERRED EMBODIMENTS

The reference numeral 1 used in the various Figures identifies a patient support table for use in X-ray photography or in some other type of beam sensing, such as electronic image storage, for instance. The patient support table is supported on telescopic legs 1a provided with floor plates 1b, which enable the table to be adjusted vertically.

The table includes a recess or aperture 5 for the accommodation of a receptor unit, generally referenced 2. The receptor unit can be moved in the X-direction, i.e. in the longitudinal direction of the table. Some of the Figures 3-9 show an X-axle in the centre of the table. To this end, the receptor unit may be mounted on a carriage or like device (not shown) mounted in the table.

The receptor unit 2 is intended for coaction with a beam source (not shown) which can be moved in the X-direction, the Y-direction, i.e. transversely to the long axis of the table, and in the Z-direction, i.e. in a vertical direction. The beam source can also be swung about a horizontal axle.

The receptor unit 2 is supported by arms 7, 9 which are joined together via a link 8 and which coast with pivot centres 11, 12 having vertical pivot axles located in the region of each side edge of the table, such as to enable the receptor unit to be swung out to alternative positions on each side of the table. The arm 9 is connected to the receptor unit 2 by means of a horizontal hinge 10. The receptor unit 2 can thus be swung out from the initial position A shown in Fig. 1 to the position B shown in Fig. 2, this latter position also being shown in Fig. 4.

The receptor unit shown in Figs. 3-9 correspond to the receptor unit shown in Figs. 1 and 2, with the exception that the units shown in Figs. 3-9 have a handgrip 2a which enables the receptor unit to be swung manually. The receptor units are also provided with an operating panel 2b having push buttons by means of which different receptor locking and receptor release operations can be initiated, the beam source activated, etc.

The receptor can be swung up about the horizontal hinge 9 from the position B shown in Fig. 4 to the position C shown in full lines in Figs. 2 and 5.

The vertical axle 11 enables the receptor unit to be swung from position C to a position D, shown in Fig. 6, in which the receptor unit is at right angles to the table 1. With the receptor unit in position D, side-on pictures and front-on pictures can be taken of a patient seated in a wheelchair, for instance.

In Fig. 7, the receptor unit 2 has been swung from the initial position shown in Figs. 1 and 3 in the other direction, about the vertical axle 12, to the position E in which the receptor unit is located slightly outside the opposing side edge of the table. It will be seen that in this position the receptor unit is also centered in the X-direction, i.e. there is no need to move the beam source laterally.

The receptor unit can be swung up from the position E shown in Fig. 7 to the position F shown in Fig. 8.

Fig. 9 illustrates the receptor unit swung from position F to position G, this position corresponding to the position D on the other side of the table.

The various Figures illustrate that when applying the inventive method, the beam can be kept centered in the X-direction in the transition between the vertical beam direction and the two horizontal beam directions, in accordance with the position shown in Figs. 1 and 2 and in Figs. 7 and 8 respectively. At the same time, the positions of the two pivot centres 11 and 12 can be determined as desired, in a manner described in more detail below.

The pivot axle about which the receptor unit is swung up is placed so that when the unit is in an upwardly swung position, the bottom edge of the unit will be located roughly in the plane of the table top or above the table top, for instance at a distance of 20 mm therefrom.

One advantage is that the operating unit 2a, 2b is located on the same side of the table as the radiologist or his/her assistant, therewith facilitating operation.

5 Figs. 10 and 11 illustrate different conceivable component measurements and the distances therebetween. The measurements also correspond to a left-hung receptor unit. In the initial position of the receptor unit

- 10 a) is the width of the receptor unit in the X-direction;
- b) is the length of the unit in the Y-direction;
- c) is the distance between the two pivot centres 11 and 12;
- d) is the width of the table;
- e) is the distance in the Y-direction between the receptor
- 15 unit and the pivot centre 11;
- f) is the distance between one side edge of the table and the pivot centre 12;
- g) is the distance in the Y-direction between the opposite side edge of the table and one end edge of the receptor
- 20 unit in position B;
- h) is the distance between this last-mentioned side edge and the pivot centre 11;
- x) is the distance in the X-direction between the centre point of the receptor unit in position A and the pivot
- 25 centres 11, 12;
- y) is the distance in the Y-direction between the centre point of the receptor unit in position A and the pivot centres 11, 12; and
- h) is a radius corresponding to the length of the link 8.

30

The following relationships will thus apply:

$$x = y = z/2$$

$$e = (c - b)/2$$

35 $f = (d - c)/2$

$$g = (2 \times c - a - d)/2$$

$$h = (c - a)/2$$

Table 1 below lists measurements which can be applied and calculated with regard to a constructional design preferred in practice.

Table 1

Receptor width	Receptor depth	Variable		Variable		Receptor Plate	Centre Receptor
		Axle distance	Table width	Distance centre Receptor	Centre Receptor		
a	b	c	d	e	f	g	h
479	580	590	700	20	55	1	56
564	580	590	700	20	55	-42	13
479	580	600	700	40	50	11	61
564	580	600	700	40	50	-32	18
479	580	610	700	60	45	21	66
564	580	610	700	60	45	-22	23

The Table shows the aforesaid relationships in one application example, in which c and f are variables.

Figs. 12-19 show a modified design of the receptor unit 2, to-wit a design in which the receptor unit is carried for movement in the Y-direction by an element 15 which may either be part of a carriage which can be moved in the X-direction in relation to the Table 1 or form part of a stand or frame that is fixed in relation to the table.

In the case of the illustrated embodiment, the element 15 includes three rollers 16 which are carried for rotation on three horizontal axles 17 and which are disposed in an elongated slot 19 provided in a further element 18 and functioning to guide movement of the further element 18 in relation to the first-mentioned element 15.

The further element 19 is provided at one end with a bearing

block 19a which coacts with a corresponding bearing block 7a on a corresponding end of the arm 7. The arm 7 of this embodiment is thus journalled more stably about the axle 12 than in the aforescribed embodiments.

5

The other end of the arm 7 includes a bearing block 7b which coacts with a bearing element 8 corresponding to the bearing element 7a on the arm 7, this arrangement corresponding functionally to the link element 8 of the aforescribed
10 embodiments. The journal axle of this embodiment is referenced 11, as in the former cases.

15

For the purpose of supporting the receptor unit 2, the arm 9 is firmly secured with the aid of an intermediate element 6 which is embraced by a U-shaped block 20 which is connected to the intermediate element 26 in a manner to allow the block 20 to pivot about the horizontal axle 10. As will be seen from Figs. 14-16, the receptor unit carried by the carrier and guide arrangement 15-19 can be displaced in the Y-direction relative to the element 15 to the position shown in Fig. 15 in which the receptor unit 2 lies outside the confines of the Table 1. The receptor unit can then be swung up to the vertical position shown in Fig. 16 about the axle 10.

25

In Fig. 17, the receptor unit 2 is shown to be swung down to a vertical position which defines an angle of 180° with the position shown in Fig. 16. X-rays can be taken of the knees of a standing or sitting patient with the receptor unit in
30 this position.

The receptor unit 2 is swung down around the axle 21, which is parallel with the axle 10 but located on a lower level than said axle.

35

The intermediate element 26 supports the receptor unit 2 through the medium of a plate 24. As will be seen from Fig.

16, the plate 24 is pivotal about a vertical axle 25. The receptor unit 2 accompanies the movement of plate 24 as it swings around the vertical axle 25, therewith enabling the receptor unit to be moved to the position shown in Fig. 19, for instance. In this position, the receptor unit is able to take pictures with an angled beam path.

Fig. 18 shows the elements 15-19 in an operative position, after having moved the receptor unit 2 in the Y-direction to the other side of the table 1 relative to the position shown in Fig. 17, and after having swung the receptor unit 2 first to a horizontal position about the axle 21, and thereafter to an upwardly swung, vertical position about the axle 10.

When the receptor-unit support element 15 forms part of a carriage which can be moved in the X-direction, the receptor unit can be moved in the X-direction from the position shown in Fig. 18. The beam source will normally accompany this movement of the receptor unit automatically. Movement of the unit in the X-direction and in the Y-direction can be achieved with the aid of appropriate motors (not shown).

As indicated in Figs. 14-19, the receptor unit 2 may include a unit 28 which carries a joy-stick 27 and which functions to facilitate movement of the receptor unit in different directions. Obviously, the unit 28 may be placed in some other position, for instance on one or both sides of the table or on a table-carried carriage (not shown).

Fig. 20 is a perspective view illustrating principally the different positions to which a receptor unit 2 can be moved in relation to a patient support table 1 when using the carrier and bearing mechanisms illustrated in Figs. 12-19. Some of the positions shown by way of example in Fig. 20 correspond to the positions referenced A, C, F in Figs. 1 and 2. However, Fig. 20 shows a number of further positions which have been made possible because the receptor unit can be

moved in the X-direction and also possibly in the Y-direction, and because the receptor unit can also be swung down from a horizontal position and adjusted about a vertical axle for operating with an angle beam path.

5

Other modifications of the invention are possible within the scope of its basic concept as expressed in the following Claims. For instance, the receptor unit may be accommodated in a frame which carries a table top, for instance a "floating" table top, i.e. a table top that is movable in the X-direction and/or the Y-direction.

10

15

20

The trend towards the development of filmless systems in which images are produced and stored electronically is particularly well served by the inventive method and the inventive patient support table. Because of the complexity of such electronic systems and because of the cost of such systems in which the receptor is connected directly to an evaluating unit, it is of extreme importance that the receptor can be used universally, therewith avoiding loose film cassettes, for instance.

CLAIMS

1. A method relating to X-ray photography or X-ray exposure or to some other type of radiation sensing, such as electronic image storage, using a beam source which can be adjusted for horizontal and vertical beam path, and possibly also for an angled beam path, and also using a receptor unit (2) which is disposed adjacent a patient support table (1) and which can be swung out and up from a position in or beneath the table in the case of a vertical beam path to a vertical position on one side of and parallel with the table in the case of a horizontal beam path, characterized by swinging the receptor unit (2) to one of two alternative positions outside each table side edge and from there upwards to a vertical position about a horizontal axle (10), said receptor unit being swung through the medium of pivot centres (11, 12), having vertical axles in the region of each side edge of the table (1).
2. A method according to Claim 1, characterized by so positioning respective pivot centres (11, 12) in the X-direction (i.e. in the longitudinal direction of the table) and in the Y-direction (i.e. in the transverse direction of the table) that centering of the beam source in the X-direction will be the same with both horizontal and vertical beam paths.
3. A method according to Claim 1 or Claim 2, characterized by swinging the receptor unit (2) outwardly in one or both of said alternative outwardly and upwardly swung positions to a position in which said unit is perpendicular to the longitudinal axis of the table (1), therewith enabling X-ray pictures to be taken with a patient seated in a wheelchair.
4. A method according to any one of Claims 1-3, characterized in that the receptor unit can be moved in the X-direction with corresponding, automatic movement of the beam

source and readjustment of said source for horizontal beam path onto the receptor unit subsequent to having swung said unit outwards and upwards outside a side edge of the table.

- 5 5. A method according to any one of Claims 1-4, characterized by supporting the receptor unit (2) with the aid of a support element (15) mounted on a frame structure which is fixed relative to the table, or on a carriage which is movable in the X-direction in relation to said table, such as to enable the receptor unit to be moved in the Y-direction
10 relative to the element (15).
6. A method according to Claim 5, characterized by raising or lowering the receptor unit from an outwardly swung, horizontal position on one side of the table (1) to a
15 vertical position above or beneath the table, by pivoting said receptor unit about mutually parallel axles (10; 21) located on mutually different levels.
- 20 7. A method according to any one of Claims 1-6, characterized by pivoting the receptor unit (2) in an outwardly swung and upwardly swung vertical position about a central, vertical axle (22) for operating with an angled beam path.
- 25 8. A patient support table equipped with a receptor unit and intended for X-ray photography or X-ray exposure or some other type of radiation sensing, e.g. electronic image storage, wherein the receptor unit (2) is preferably supported for movement in the X-direction (i.e. in the longitudinal
30 direction of the table) and adapted for coaction with a beam source which is movable in the X-direction, the Y-direction (in the transverse direction of the table) and in the Z-direction (the vertical direction) and can be swung about a horizontal axle, and wherein the receptor unit (2) can be
35 swung out and up about a vertical and a horizontal axle from a position in or beneath the table (1) in the case of a vertical beam path, to a position on one side of and parallel

with the table in the case of a horizontal beam path, characterized in that the receptor unit (2) is carried by arms (7, 9) which are joined together, preferably by a link (8), through the medium of pivot centres (11, 12) having vertical axles in the region of each side edge of the table (1), such as to enable the receptor unit (2) to be swung out to alternative positions on each side of the table (1) and there be swung up to a position in which the receptor unit is parallel with the table for operating with a horizontal beam path, this latter movement of the receptor unit being possible by virtue of a horizontal hinge (10) which connects said unit to one (9) of said arms.

9. A table according to Claim 8, characterized in that the receptor unit (2) can be swung from the position for operation with a horizontal beam path to a position perpendicular to the table, through the medium of a vertical axle.

10. A table according to Claim 9, characterized in that the vertical axle constitutes one (11) of said pivot centres (11, 12).

11. A table according to any one of Claims 8-10, characterized in that the lengths of the arms (7, 9) and the link (8) are such that the receptor unit (2) will take a position for operation with a centered beam path without being moved in the X-direction from its original position (position A) in or beneath the table (1), irrespective of from which side the receptor unit is swung outwards and upwards.

12. A table according to any one of Claims 8-11, characterized in that the receptor unit (1) and its associated arms (7, 9), link (8) and pivot centres (11, 12) are supported by a carriage mounted in or on the underside of the table (1) and movable in the X-direction.

13. A table according to any one of Claims 8-12, characterized in that the table top is movable in the X-direction and/or the Y-direction, and in that the receptor unit (1) is mounted in a frame carried by said table top.

5

14. A table according to Claim 12 or Claim 13, characterized in that the carriage or the frame includes an element (15) having means (16-19) for guiding movement of a further element (18) journaled to one (7) of the arms (7, 9),
10 wherein the other (9) of said arms carries a block (20) in which a plate (24) carrying the receptor unit (20) is journaled for pivotal movement about a horizontal axle (10).

15

15. A table according to Claim 14, characterized in that the block (20) has a further axle (21) which is parallel with said horizontal axle (10) and on which the plate supporting said receiver receptor unit is pivotally mounted.

20

16. A table according to Claim 15, characterized in that the receptor unit (2) is connected to the plate (24) by means of an axle (25) which extends perpendicularly to the plate and about which the receptor unit can be swung for operation with an angled beam path.

25

17. A table according to any one of Claims 8-16, characterized in that the table, its frame, the carriage or the receptor unit includes an operating device, e.g. a joy-stick, for manoeuvring the linear movement and pivotal movement of the receptor unit (2) in relation to the patient support
30 table.

Fig. 1

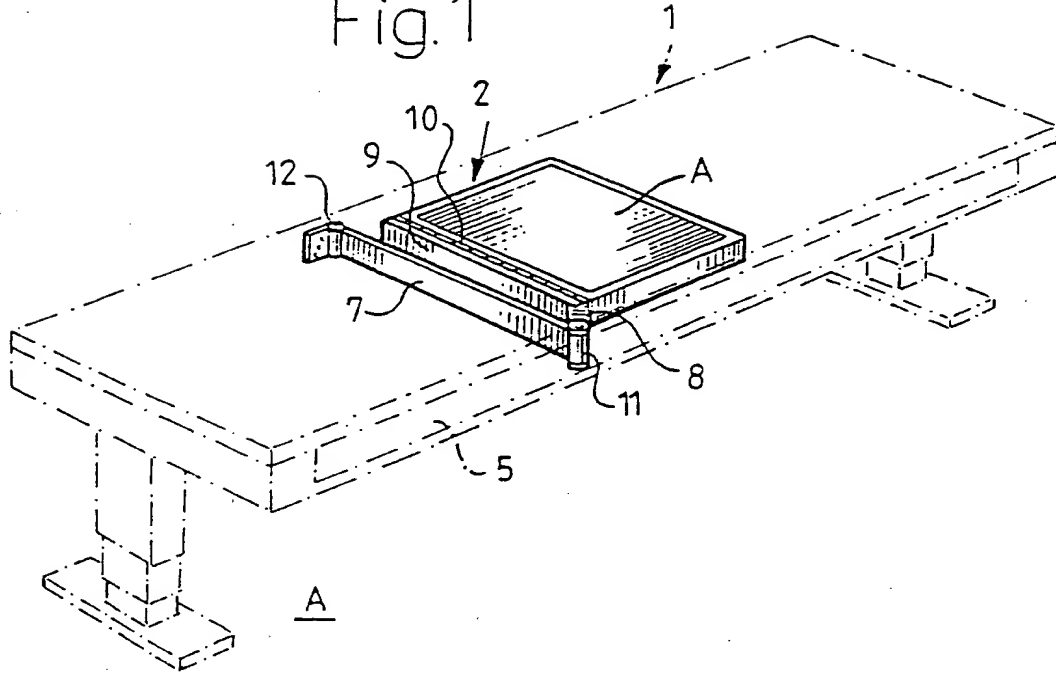


Fig. 2

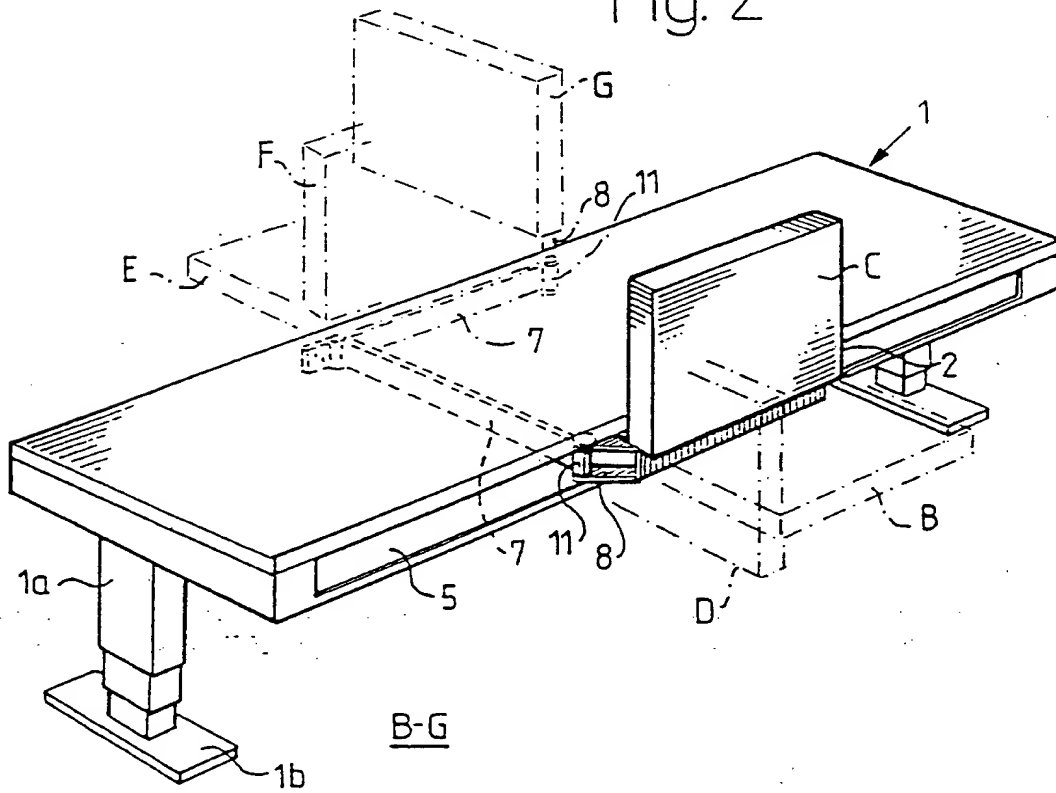


Fig. 3

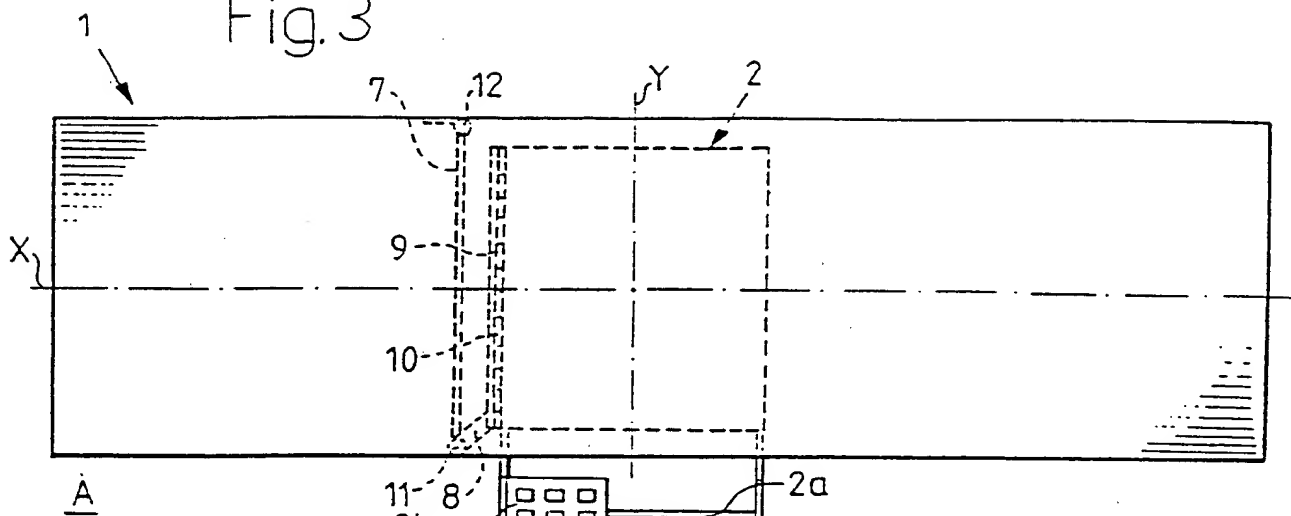


Fig. 4

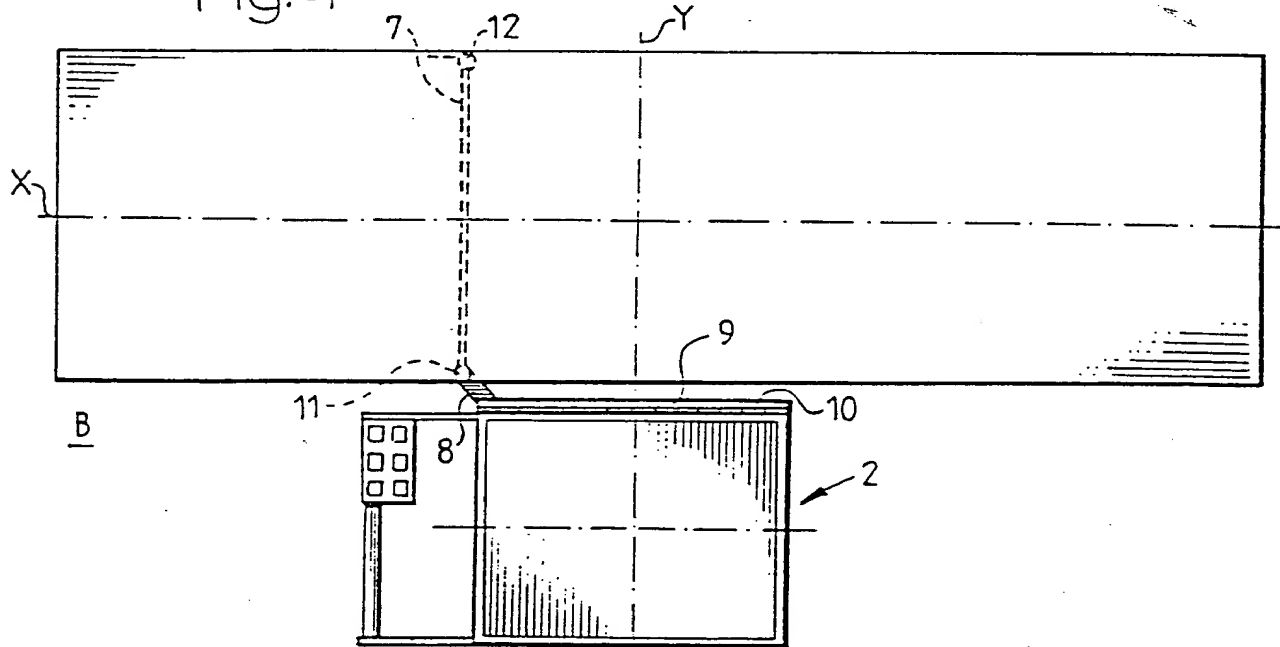


Fig. 5

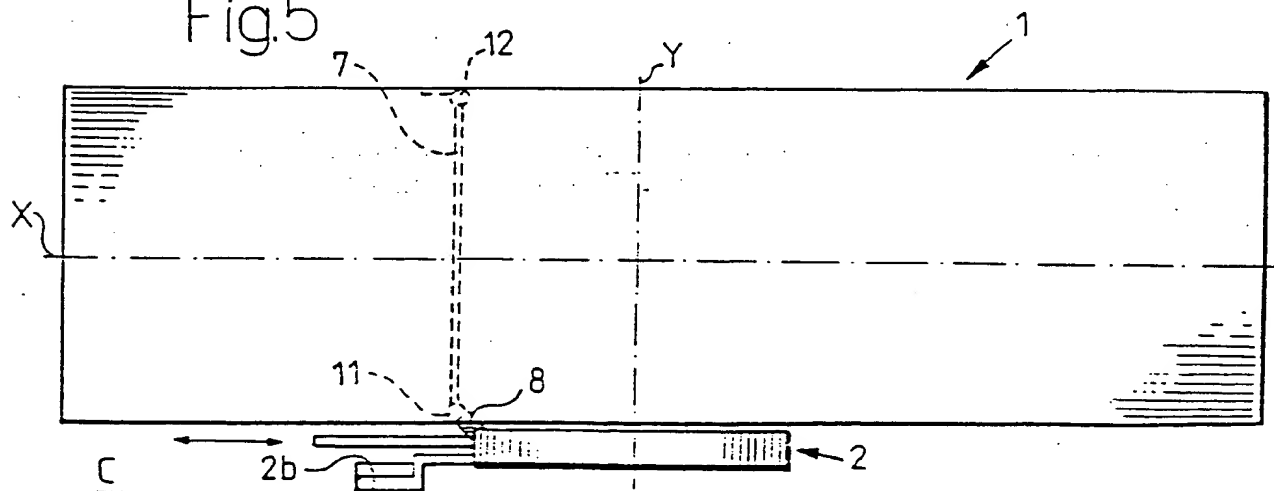


Fig. 8

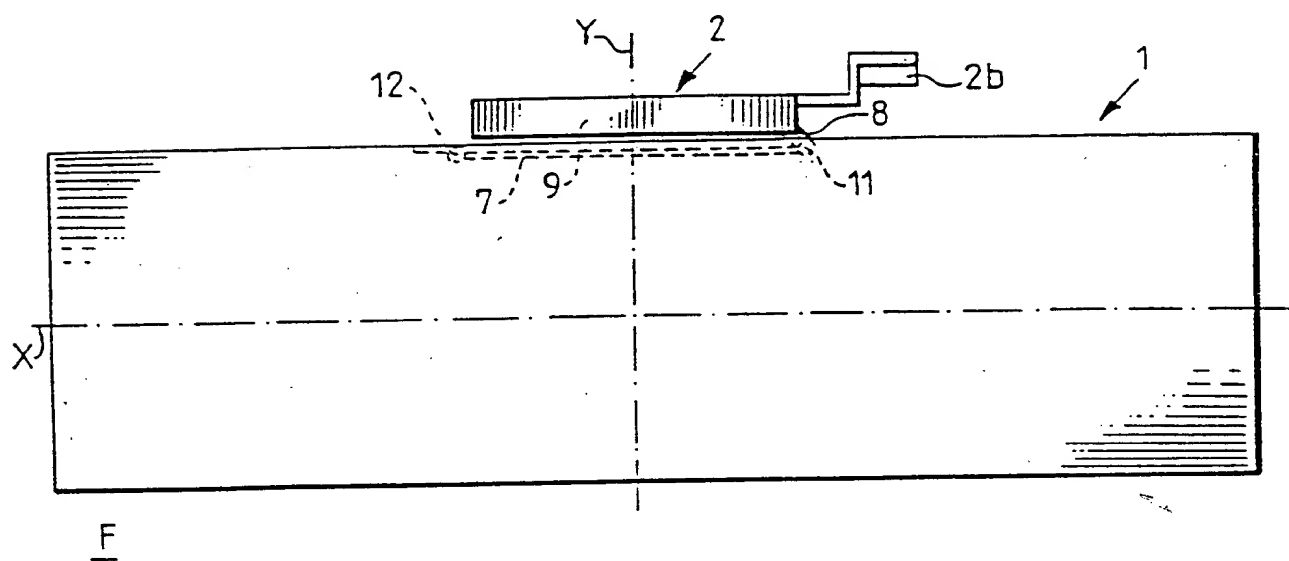


Fig.9

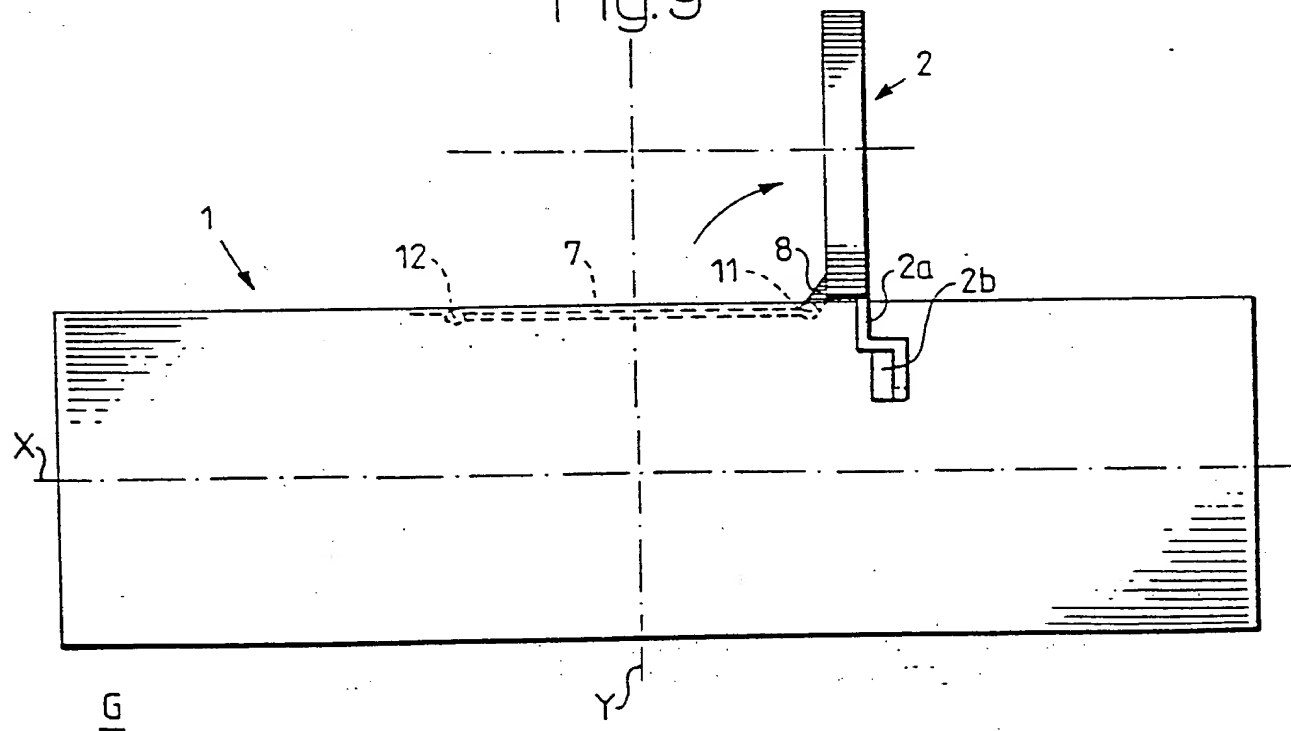


Fig. 10

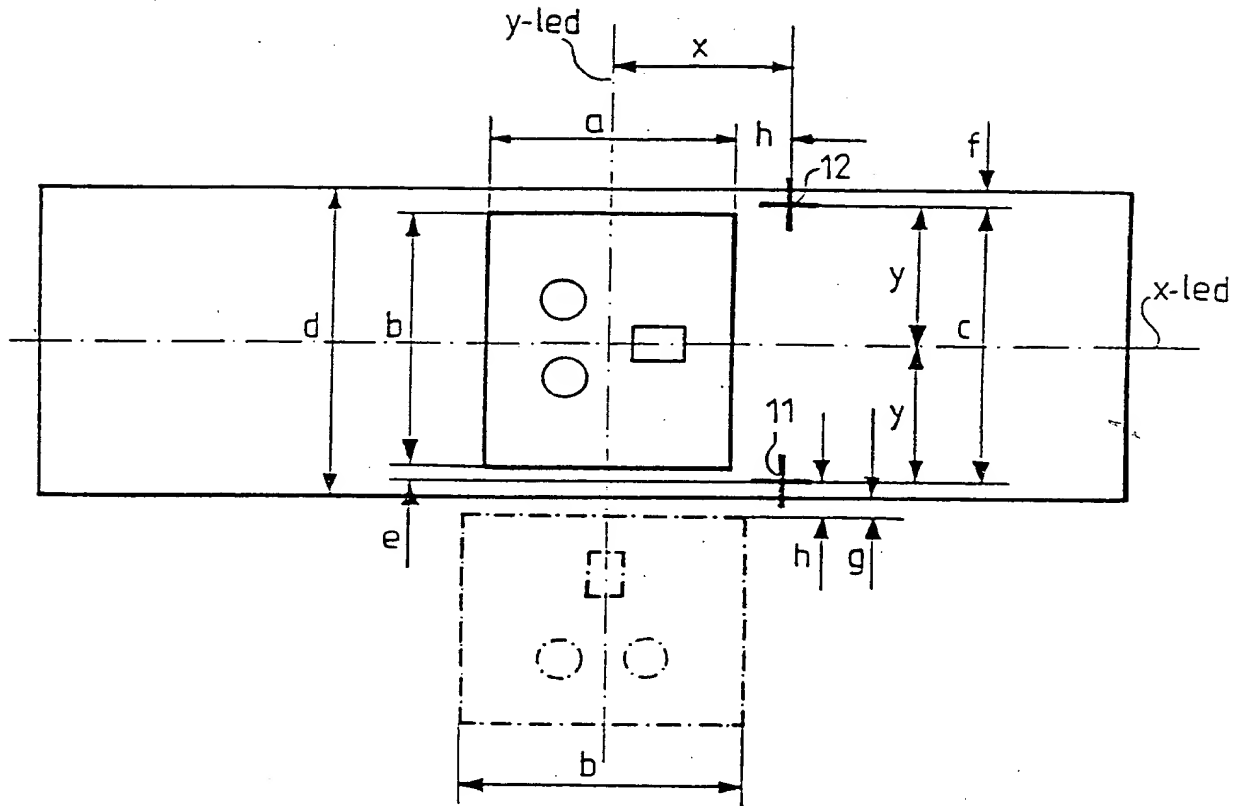


Fig. 11

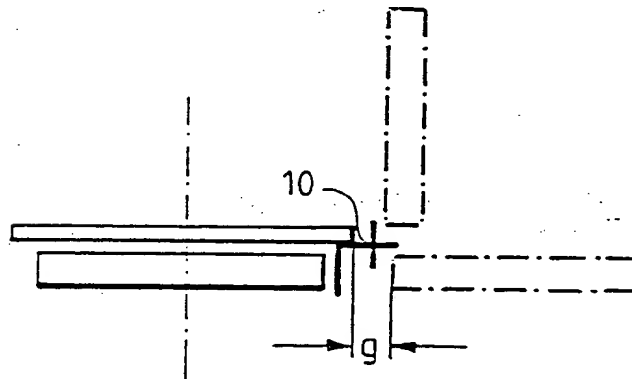


Fig.12

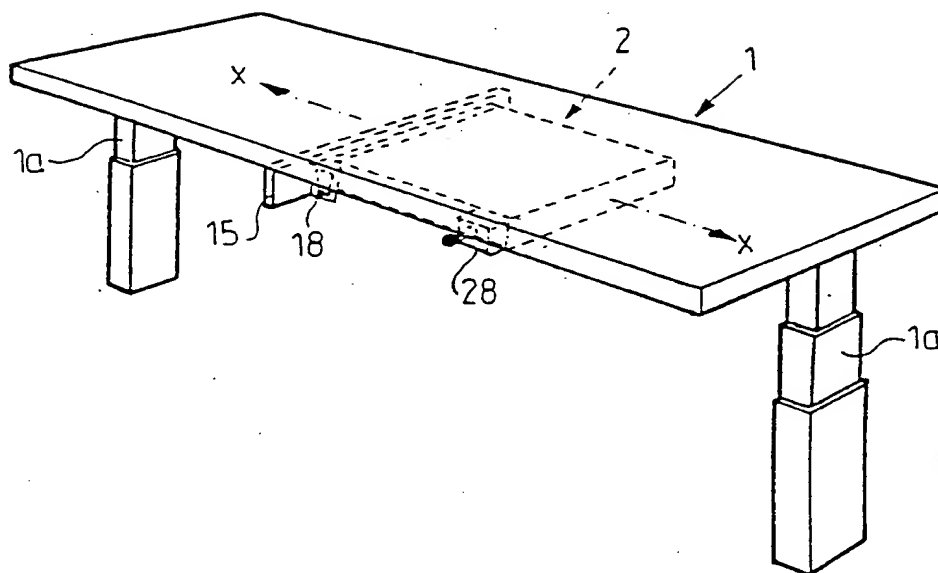


Fig.13

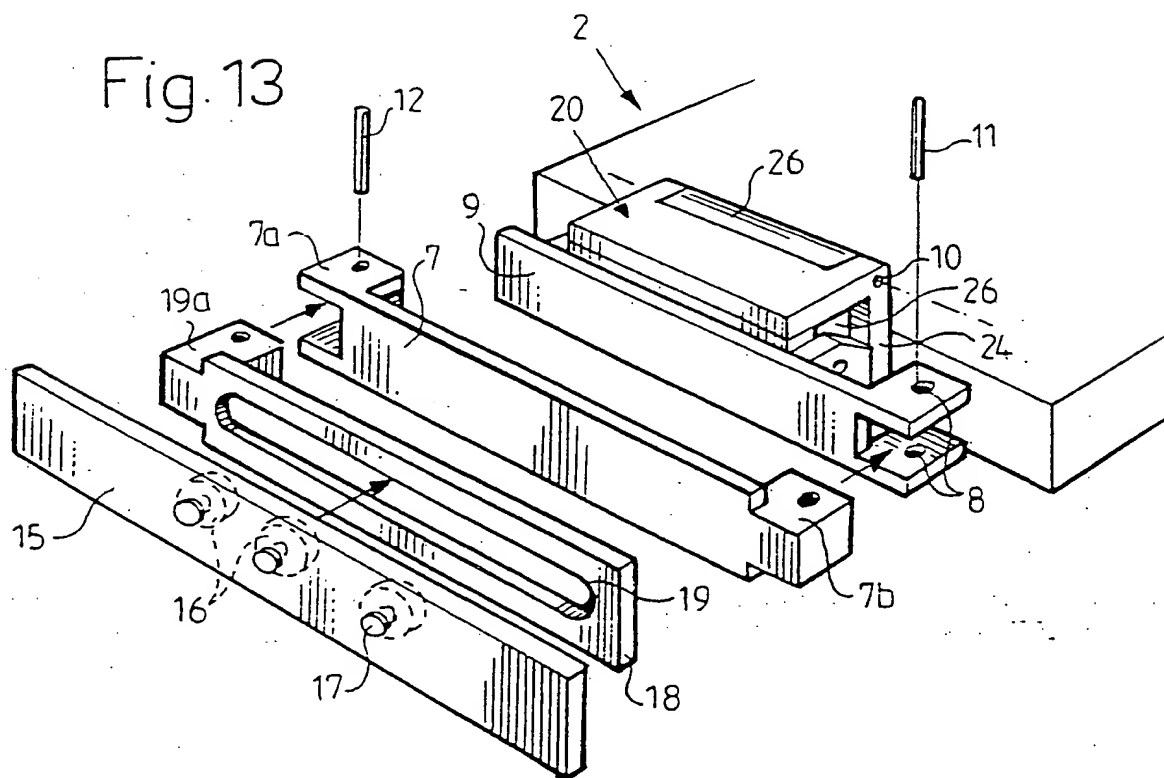


Fig.14

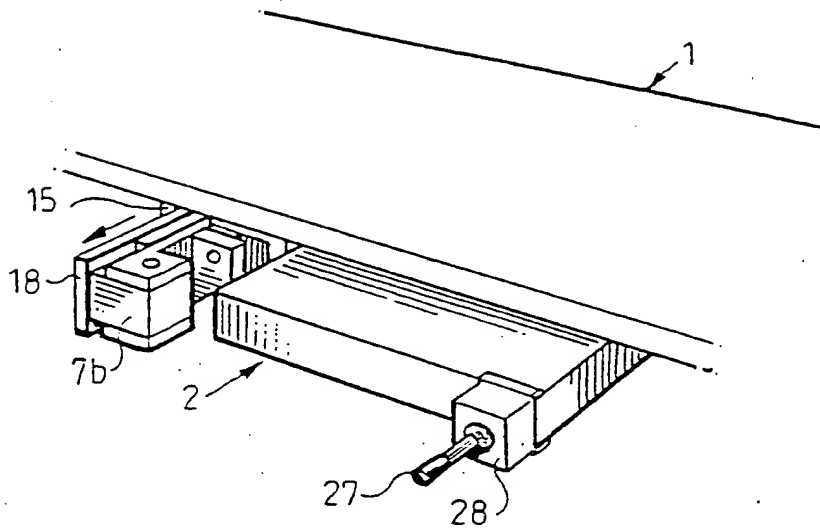


Fig.15

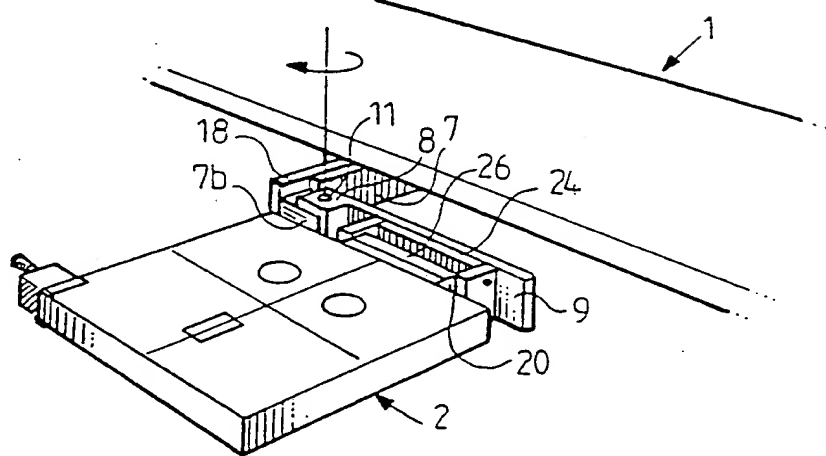


Fig.16

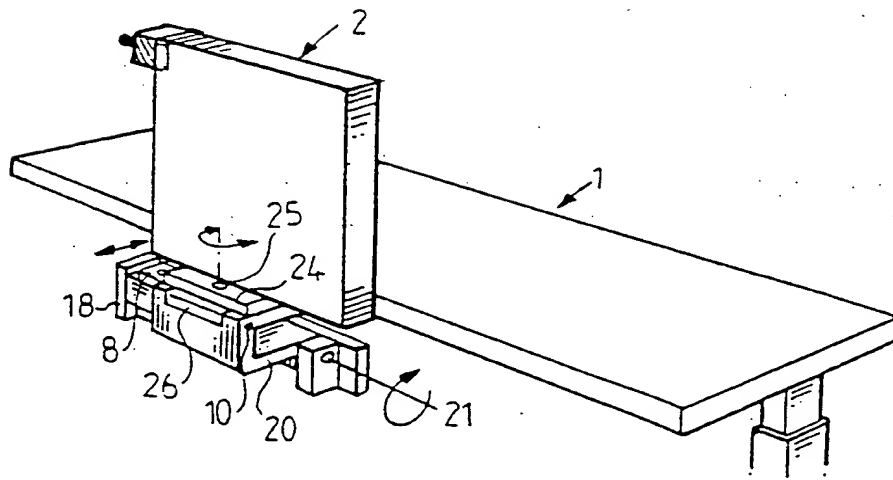


Fig.17

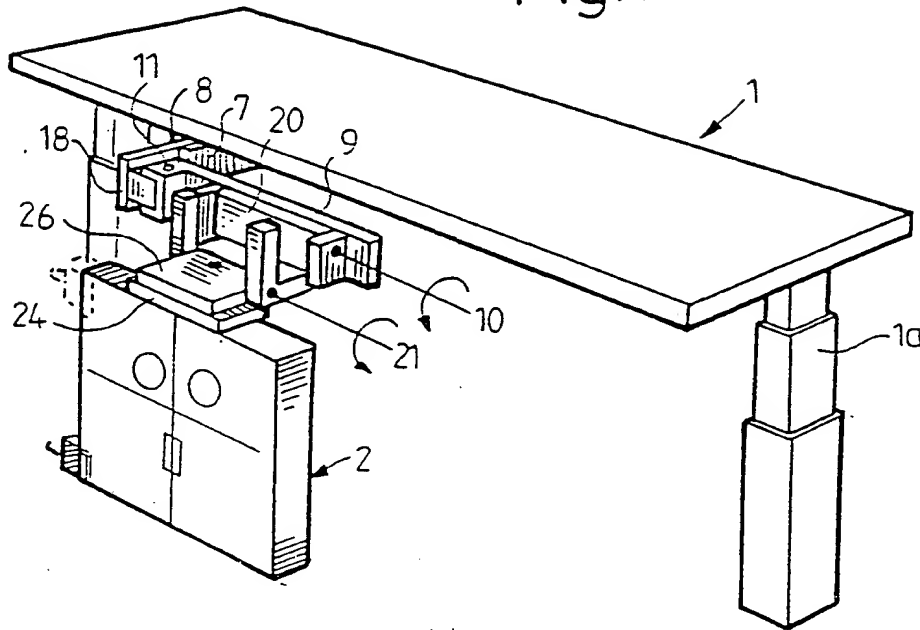


Fig.18

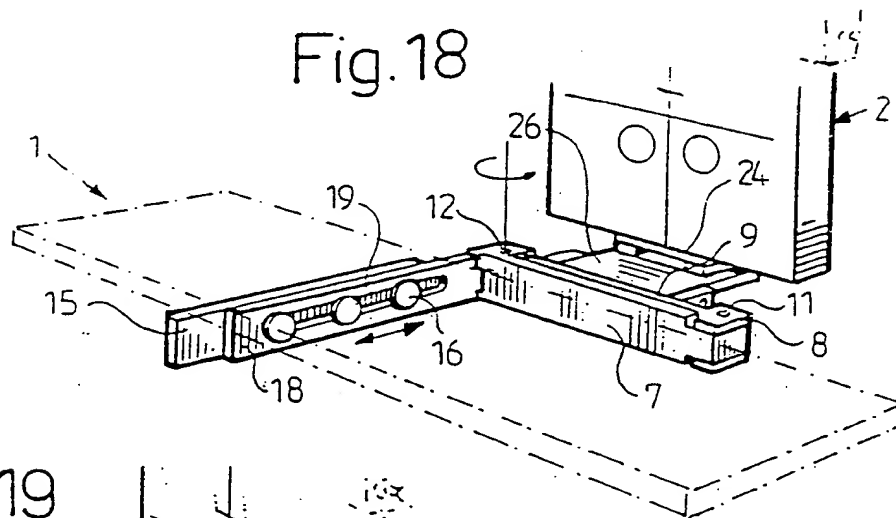


Fig. 19

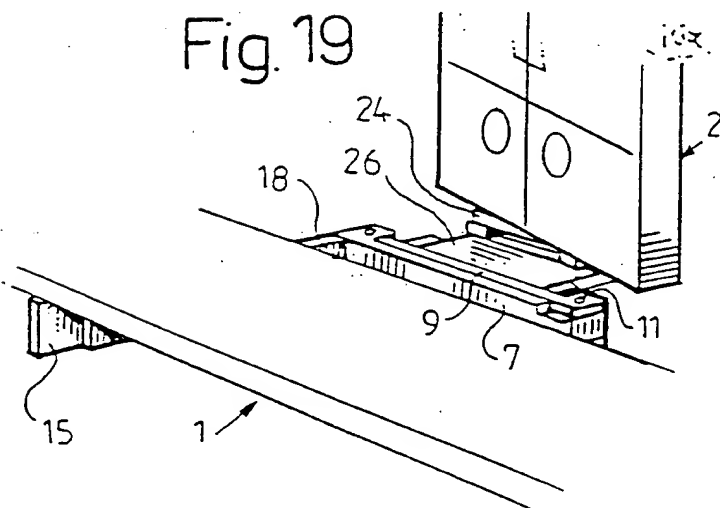
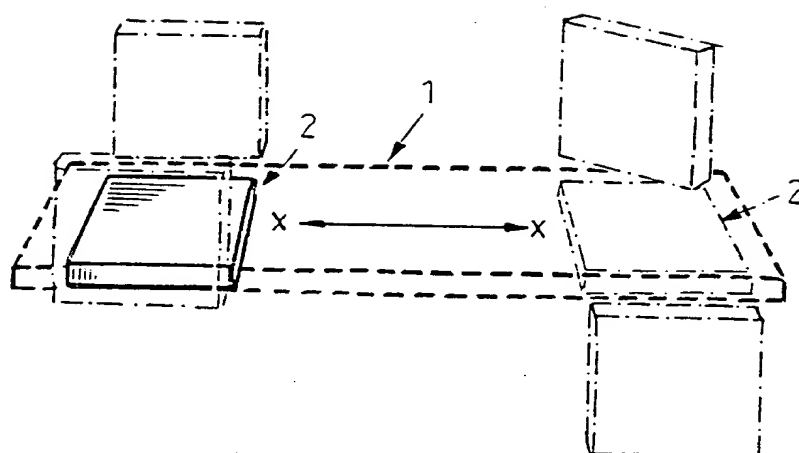


Fig. 20



1

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 95/00887

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: A61B 6/04, A61B 6/00, H05G 1/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: A61B, H05G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4468803 A (RONCI), 28 August 1984 (28.08.84) --	1-17
A	US 5157707 A (OHLSON), 20 October 1992 (20.10.92) --	1-17
A	SE 463237 B (AO MEDICAL PRODUCTS AB), 29 October 1990 (29.10.90) -- -----	1-17

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

& document member of the same patent family

Date of the actual completion of the international search

13 Sept 1995

Date of mailing of the international search report

13-11-1995

Name and mailing address of the ISA/
Swedish Patent Office
Box 5055, S-102 42 STOCKHOLM
Facsimile No. +46 8 666 02 86

Authorized officer

Per-Olof Warnbo
Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT
Information on patent family members

28/08/95

International application No.

PCT/SE 95/00887

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US-A-	4468803	28/08/84	NONE		
US-A-	5157707	20/10/92	EP-A-	0458890	04/12/91
			SE-B,C-	463187	22/10/90
			SE-A-	8900581	21/08/90
			WO-A-	9009147	23/08/90
SE-B-	463237	29/10/90	SE-A-	8900580	21/08/90